EBERLINE SERVICES

0060776

August 4, 2003

Mr. Steve Trent
Fluor Hanford Inc.
825 Jadwin Avenue
Richland, WA 99352

Reference: **P.O. #630**
Eberline Services R3-06-068-7538, SDG H2264

Dear Mr. Trent:

Enclosed is the data report for one solid sample designated under SAF No. F03-006 received at Eberline Services on June 13, 2003. The sample was analyzed according to the accompanying chain-of-custody document.

Please call if you have any questions concerning this report.

Sincerely,

Melissa Mannion

Melissa C. Mannion
Program Manager

MCM

Enclosure: Data Package

Analytical Services
2030 Wright Avenue
P.O. Box 4040
Richmond, California 94804-0040
(510) 235-2633 Fax (510) 235-0438
Toll Free (800) 841-5487
www.eberlineservices.com

1.0 GENERAL

Fluor Hanford Inc. (FH) Sample Delivery Group H2264 was composed of one solid (soil) samples designated under SAF No. F03-006 with a Project Designations of: 200-PW-2/200-PW-4 OU – Borehole Soil Sampling.

The sample was received as stated on the Chain-of-Custody documents. Any discrepancies are noted on the Eberline Services Sample Receipt Checklist.

2.0 ANALYSIS NOTES

2.1 Tritium Analyses

No problems were encountered during the course of the analyses.

2.2 Carbon-14 Analyses

No problems were encountered during the course of the analyses.

2.3 Nickel-63 Analyses

No problems were encountered during the course of the analyses.

2.4 Total Strontium Analyses

No problems were encountered during the course of the analyses.

2.5 Technetium-99 Analyses

No problems were encountered during the course of the analyses.

2.6 Iodine-129 Analyses

No problems were encountered during the course of the analyses.

2.7 Isotopic Thorium Analyses

No problems were encountered during the course of the analyses.

2.8 Isotopic Uranium Analyses

No problems were encountered during the course of the analyses.

2.9 Total Uranium Analyses

No problems were encountered during the course of the analyses.

2.10 Neptunium-237 Analyses

The LCS percent recovery (78%) was slightly below the laboratory protocol limits (80 to 120%), but within the contract limits (70 to 130%). No other problems were encountered during the course of the analyses.

2.11 Isotopic Plutonium Analyses

No problems were encountered during the course of the reanalyses.

2.12 Americium-241 Analyses

No problems were encountered during the course of the analyses.

2.13 Gamma Spectroscopy Analyses

No problems were encountered during the course of the analyses.

Case Narrative Certification Statement

"I certify that this data package is in compliance with the SOW, both technically and for completeness, for other than the conditions detailed above. Release of the data obtained in this hard copy data package has been authorized by the Laboratory Manager or a designee, as verified by the following signature."

Melissa Mannion — 8/4/3

Melissa C. Mannion
Program Manager

Date

E B E R L I N E S E R V I C E S / R I C H M O N D
SAMPLE DELIVERY GROUP H2264

SDG	7538
Contact	Melissa C. Mannion

Client	Hanford
Contract	No. 630
Case no	SDG H2264

S U M M A R Y D A T A S E C T I O N

T A B L E O F C O N T E N T S

Melissa Mannion
Prepared by

Melissa Mannion
Reviewed by

Lab id	EBRLNE
Protocol	Hanford
Version	Ver 1.0
Form	DVD-TOC
Version	3.06
Report date	08/04/03

EBERLINE SERVICES/RICHMOND

SAMPLE DELIVERY GROUP H2264

SDG 7538
Contact Melissa C. Mannion

REPORT GUIDE

Client Hanford
Contract No. 630
Case no SDG H2264

ABOUT THE DATA SUMMARY SECTION

The Data Summary Section of a Data Package has all data, in several useful orders, necessary for first level, routine review of the data package for a Sample Delivery Group (SDG). This section follows the Data Package Narrative, which has an overview of the data package and a discussion of special problems. It is followed by the Raw Data Section, which has full details.

The Data Summary Section has several groups of reports:

SAMPLE SUMMARIES

The Sample and QC Summary Reports show all samples, including QC samples, reported in one SDG. These reports cross-reference client and lab sample identifiers.

PREPARATION BATCH SUMMARY

The Preparation Batch Summary Report shows all preparation batches (lab groupings reflecting how work was organized) relevant to the reported SDG with information necessary to check the completeness and consistency of the SDG.

WORK SUMMARY

The Work Summary Report shows all samples and work done on them relevant to the reported SDG.

METHOD BLANKS

The Method Blank Reports, one for each Method Blank relevant to the SDG, show all results and primary supporting information for the blanks.

LAB CONTROL SAMPLES

The Lab Control Sample Reports, one for each Lab Control Sample relevant to the SDG, show all results, recoveries and primary supporting information for these QC samples.

Lab id EBRLNE
Protocol Hanford
Version Ver 1.0
Form DVD-RG
Version 3.06
Report date 08/04/03

SDG 7538
Contact Melissa C. Mannion

GUIDE, cont.

Client Hanford
Contract No. 630
Case no SDG_H2264

ABOUT THE DATA SUMMARY SECTION

DUPLICATES

The Duplicate Reports, one for each Duplicate and Original sample pair relevant to the SDG, show all results, differences and primary supporting information for these QC samples.

MATRIX SPIKES

The Matrix Spike Reports, one for each Spiked and Original sample pair relevant to the SDG, show all results, recoveries and primary supporting information for these QC samples.

DATA SHEETS

The Data Sheet Reports, one for each client sample in the SDG, show all results and primary supporting information for these samples.

METHOD SUMMARIES

The Method Summary Reports, one for each test used in the SDG, show all results, QC and method performance data for one analyte on one or two pages. (A test is a short code for the method used to do certain work to the client's specification.)

REPORT GUIDES

The Report Guides, one for each of the above groups of reports, have documentation on how to read the associated reports.

Lab id EBRLNE
Protocol Hanford
Version Ver 1.0
Form DVD-RG
Version 3.06
Report date 08/04/03

EBERLINE SERVICES/RICHMOND

SAMPLE DELIVERY GROUP H2264

SDG 7538
Contact Melissa C. Mannion

LAB SAMPLE SUMMARY

Client Hanford
Contract No. 630
Case no SDG H2264

LAB SAMPLE ID	CLIENT SAMPLE ID	LOCATION	MATRIX	LEVEL	SAF NO	CHAIN OF CUSTODY	COLLECTED
R306068-01	B161C2	216-B-12 (C3246)	SOLID		F03-006	F03-006-189	06/11/03 09:25
R306068-02	Lab Control Sample		SOLID		F03-006		
R306068-03	Method Blank		SOLID		F03-006		
R306068-04	Duplicate (R306068-01)	216-B-12 (C3246)	SOLID		F03-006		06/11/03 09:25
R306068-05	Spike (R306068-01)	216-B-12 (C3246)	SOLID		F03-006		06/11/03 09:25

Lab id EBRLNE
Protocol Hanford
Version Ver 1.0
Form DVD-LS
Version 3.06
Report date 08/04/03

EBERLINE SERVICES/RICHMOND

SAMPLE DELIVERY GROUP H2264

QC SUMMARY

SDG 7538
Contact Melissa C. Mannion

Client Hanford
Contract No. 630
Case no SDG H2264

QC BATCH	CHAIN OF CUSTODY	CLIENT SAMPLE ID	MATRIX	% SOLIDS	SAMPLE AMOUNT	BASIS AMOUNT	DAYS SINCE RECEIVED	DAYS SINCE COLL	LAB SAMPLE ID	DEPARTMENT SAMPLE ID
7538	F03-006-189	B161C2	SOLID	97.4	258.7 g		06/13/03	2	R306068-01	7538-001
		Method Blank	SOLID						R306068-03	7538-003
		Lab Control Sample	SOLID						R306068-02	7538-002
		Duplicate (R306068-01)	SOLID	97.4	258.7 g		06/13/03	2	R306068-04	7538-004
		Spike (R306068-01)	SOLID	97.4	258.7 g		06/13/03	2	R306068-05	7538-005

Lab id EBRLNE
Protocol Hanford
Version Ver 1.0
Form DVD-QS
Version 3.06
Report date 08/04/03

EBERLINE SERVICES/RICHMOND

SAMPLE DELIVERY GROUP H2264

PREP BATCH SUMMARY

SDG 7538
Contact Melissa C. Mannion

Client Hanford
Contract No. 630
Case no SDG H2264

TEST	MATRIX	METHOD	PREPARATION BATCH	ERROR 2σ %	PLANCHETS ANALYZED CLIENT	MORE	RE	BLANK	LCS	DUP/ORIG	MS/ORIG	QUALIFIERS
Alpha Spectroscopy												
AM	SOLID	Americium 241 in Soil	7071-086	5.0	1			1	1	1/1		
NP	SOLID	Neptunium in Soil	7071-086	5.0	1			1	1	1/1		
PU	SOLID	Plutonium, Isotopic in Solids	7071-086	5.0	1			1	1	1/1		
TH	SOLID	Thorium, Isotopic in Soil	7071-086	5.0	1			1	1	1/1		
U	SOLID	Uranium, Isotopic in Soil	7071-086	5.0	1			1	1	1/1		
Beta Counting												
SR	SOLID	Total Strontium in Soil	7071-086	10.0	1			1	1	1/1		
TC	SOLID	Technetium 99 in Soil	7071-086	10.0	1			1	1	1/1		
Gamma Spectroscopy												
GAM	SOLID	Gamma Scan	7071-086	15.0	1			1	1	1/1		
I	SOLID	Iodine 129 in Soil	7071-086	10.0	1			1	1	1/1		
Kinetic Phosphorimetry (KPA)												
U_T	SOLID	Uranium, Total in Soil	7071-086	9.0	1			1	1	1/1		
Liquid Scintillation Counting												
C	SOLID	Carbon 14 in Soil	7071-086	10.0	1			1	1	1/1		
H	SOLID	Tritium in Soil	7071-086	10.0	1			1	1	1/1	1/1	X
NI_L	SOLID	Nickel 63 in Soil	7071-086	10.0	1			1	1	1/1		

Duplicates and Matrix Spikes are those with original (Client) sample in this Sample Delivery Group.
Blank and LCS planchets are those in the same preparation batch as some Client, Duplicate or Spike sample.

Lab id EBRLNE
Protocol Hanford
Version Ver 1.0
Form DVD-PBS
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SAMPLE DELIVERY GROUP H2264

LAB WORK SUMMARY

SDG 7538
Contact Melissa C. Mannion

Client Hanford
Contract No. 630
Case no SDG H2264

LAB SAMPLE COLLECTED RECEIVED	CLIENT SAMPLE ID LOCATION CUSTODY	SAF No	MATRIX	PLANCHET	TEST	SUF-FIX	ANALYZED	REVIEWED	BY	METHOD
R306068-01	B161C2			7538-001	AM		07/21/03	08/03/03	MCM	Americium 241 in Soil
06/11/03	216-B-12 (C3246)		SOLID	7538-001	C		07/18/03	08/03/03	MCM	Carbon 14 in Soil
06/13/03	F03-006-189	F03-006		7538-001	GAM		06/27/03	08/03/03	MCM	Gamma Scan
				7538-001	H		07/24/03	08/03/03	MCM	Tritium in Soil
				7538-001	I		07/24/03	08/03/03	MCM	Iodine 129 in Soil
				7538-001	NI_L		07/18/03	08/03/03	MCM	Nickel 63 in Soil
				7538-001	NP		07/22/03	08/03/03	MCM	Neptunium in Soil
				7538-001	PU		07/23/03	08/03/03	MCM	Plutonium, Isotopic in Solids
				7538-001	SR		07/18/03	08/03/03	MCM	Total Strontium in Soil
				7538-001	TC		07/28/03	08/03/03	MCM	Technetium 99 in Soil
				7538-001	TH		07/23/03	08/03/03	MCM	Thorium, Isotopic in Soil
				7538-001	U		07/22/03	08/03/03	MCM	Uranium, Isotopic in Soil
				7538-001	U_T		07/03/03	08/03/03	MCM	Uranium, Total in Soil
R306068-02	Lab Control Sample			7538-002	AM		07/21/03	08/03/03	MCM	Americium 241 in Soil
			SOLID	7538-002	C		07/18/03	08/03/03	MCM	Carbon 14 in Soil
		F03-006		7538-002	GAM		06/27/03	08/03/03	MCM	Gamma Scan
				7538-002	H		07/24/03	08/03/03	MCM	Tritium in Soil
				7538-002	I		07/28/03	08/03/03	MCM	Iodine 129 in Soil
				7538-002	NI_L		07/19/03	08/03/03	MCM	Nickel 63 in Soil
				7538-002	NP		07/22/03	08/03/03	MCM	Neptunium in Soil
				7538-002	PU		07/23/03	08/03/03	MCM	Plutonium, Isotopic in Solids
				7538-002	SR		07/18/03	08/03/03	MCM	Total Strontium in Soil
				7538-002	TC		07/25/03	08/03/03	MCM	Technetium 99 in Soil
				7538-002	TH		07/23/03	08/03/03	MCM	Thorium, Isotopic in Soil
				7538-002	U		07/22/03	08/03/03	MCM	Uranium, Isotopic in Soil
				7538-002	U_T		07/03/03	08/03/03	MCM	Uranium, Total in Soil

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EBERLINE SERVICES/RICHMOND

SAMPLE DELIVERY GROUP H2264

SDG 7538
Contact Melissa C. Mannion

WORK SUMMARY, cont.

Client Hanford
Contract No. 630
Case no SDG H2264

LAB SAMPLE / COLLECTED / RECEIVED	CLIENT SAMPLE ID / LOCATION / CUSTODY	SAF No	MATRIX	PLANCHET	TEST	SUF-FIX	ANALYZED	REVIEWED	BY	METHOD
R306068-03	Method Blank			7538-003	AM		07/21/03	08/03/03	MCM	Americium 241 in Soil
			SOLID	7538-003	C		07/18/03	08/03/03	MCM	Carbon 14 in Soil
		F03-006		7538-003	GAM		06/28/03	08/03/03	MCM	Gamma Scan
				7538-003	H		07/25/03	08/03/03	MCM	Tritium in Soil
				7538-003	I		07/25/03	08/03/03	MCM	Iodine 129 in Soil
				7538-003	NI_L		07/19/03	08/03/03	MCM	Nickel 63 in Soil
				7538-003	NP		07/22/03	08/03/03	MCM	Neptunium in Soil
				7538-003	PU		07/23/03	08/03/03	MCM	Plutonium, Isotopic in Solids
				7538-003	SR		07/18/03	08/03/03	MCM	Total Strontium in Soil
				7538-003	TC		07/26/03	08/03/03	MCM	Technetium 99 in Soil
				7538-003	TH		07/23/03	08/03/03	MCM	Thorium, Isotopic in Soil
				7538-003	U		07/22/03	08/03/03	MCM	Uranium, Isotopic in Soil
				7538-003	U_T		07/03/03	08/03/03	MCM	Uranium, Total in Soil
R306068-04	Duplicate (R306068-01)			7538-004	AM		07/21/03	08/03/03	MCM	Americium 241 in Soil
06/11/03	216-B-12 (C3246)		SOLID	7538-004	C		07/18/03	08/03/03	MCM	Carbon 14 in Soil
06/13/03		F03-006		7538-004	GAM		06/28/03	08/03/03	MCM	Gamma Scan
				7538-004	H		07/25/03	08/03/03	MCM	Tritium in Soil
				7538-004	I		07/25/03	08/03/03	MCM	Iodine 129 in Soil
				7538-004	NI_L		07/19/03	08/03/03	MCM	Nickel 63 in Soil
				7538-004	NP		07/22/03	08/03/03	MCM	Neptunium in Soil
				7538-004	PU		07/23/03	08/03/03	MCM	Plutonium, Isotopic in Solids
				7538-004	SR		07/18/03	08/03/03	MCM	Total Strontium in Soil
				7538-004	TC		07/25/03	08/03/03	MCM	Technetium 99 in Soil
				7538-004	TH		07/23/03	08/03/03	MCM	Thorium, Isotopic in Soil
				7538-004	U		07/22/03	08/03/03	MCM	Uranium, Isotopic in Soil
				7538-004	U_T		07/03/03	08/03/03	MCM	Uranium, Total in Soil
R306068-05	Spike (R306068-01)			7538-005	H		07/25/03	08/03/03	MCM	Tritium in Soil
06/11/03	216-B-12 (C3246)		SOLID							
06/13/03		F03-006								

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SDG 7538
Contact Melissa C. Mannion

WORK SUMMARY, cont.

Client Hanford
Contract No. 630
Case no SDG H2264

COUNTS OF TESTS BY SAMPLE TYPE

TEST	SAF No	METHOD	REFERENCE	CLIENT	MORE	RE	BLANK	LCS	DUP	SPIKE	TOTAL
AM	F03-006	Americium 241 in Soil	AMCMISO_IE_PLATE_AEA	1			1	1	1		4
C	F03-006	Carbon 14 in Soil	C14_COX_LSC	1			1	1	1		4
GAM	F03-006	Gamma Scan	GAMMA_GS	1			1	1	1		4
H	F03-006	Tritium in Soil	906.0_H3_LSC	1			1	1	1	1	5
I	F03-006	Iodine 129 in Soil	I129_SEP_LEPS_GS	1			1	1	1		4
NI_L	F03-006	Nickel 63 in Soil	NI63_LSC	1			1	1	1		4
NP	F03-006	Neptunium in Soil	NP237_LLE_PLATE_AEA	1			1	1	1		4
PU	F03-006	Plutonium, Isotopic in Solids	PUISO_PLATE_AEA	1			1	1	1		4
SR	F03-006	Total Strontium in Soil	SRTOT_SEP_PRECIP_GPC	1			1	1	1		4
TC	F03-006	Technetium 99 in Soil	TC99_TR_SEP_LSC	1			1	1	1		4
TH	F03-006	Thorium, Isotopic in Soil	THISO_IE_PLATE_AEA	1			1	1	1		4
U	F03-006	Uranium, Isotopic in Soil	UISO_PLATE_AEA	1			1	1	1		4
U_T	F03-006	Uranium, Total in Soil	UTOT_KPA	1			1	1	1		4
TOTALS				13			13	13	13	1	53

Lab id EBRLNE
Protocol Hanford
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EBERLINE SERVICES / RICHMOND

SAMPLE DELIVERY GROUP H2264

7538-003 Method Blank

METHOD BLANK

SDG 7538	Client/Case no Hanford	SDG H2264	
Contact Melissa C. Mannion	Contract No. 630		
Lab sample id R306068-03	Client sample id Method Blank		
Dept sample id 7538-003	Material/Matrix	SOLID	
	SAF No F03-006		

ANALYTE	CAS NO	RESULT pCi/g	2σ ERR (COUNT)	MDA pCi/g	RDL pCi/g	QUALI-FIERS	TEST
Tritium	10028-17-8	0.031	0.15	0.26	400	U	H
Carbon 14	14762-75-5	-0.143	1.2	2.0	50	U	C
Nickel 63	13981-37-8	-0.397	1.2	2.0	30	U	NI_L
Total Strontium	SR-RAD	0.026	0.22	0.44	1.0	U	SR
Technetium 99	14133-76-7	0.115	0.18	0.56	15	U	TC
Thorium 228	14274-82-9	0.038	0.077	0.15		U	TH
Thorium 230	14269-63-7	0.134	0.15	0.32	1.0	U	TH
Thorium 232	TH-232	0	0.038	0.15	1.0	U	TH
Total Uranium (ug/g)	7440-61-1	0	0.002	0.004	1.0	U	U_T
Uranium 233/234	U-233/234	0	0.038	0.15	1.0	U	U
Uranium 235	15117-96-1	0.023	0.046	0.18	1.0	U	U
Uranium 238	U-238	0.019	0.038	0.15	1.0	U	U
Neptunium 237	13994-20-2	-0.004	0.015	0.042	1.0	U	NP
Plutonium 238	13981-16-3	0.049	0.049	0.19	1.0	U	PU
Plutonium 239/240	PU-239/240	0	0.049	0.19	1.0	U	PU
Americium 241	14596-10-2	0.136	0.14	0.26	1.0	U	AM
Iodine 129	15046-84-1	0.201	0.32	0.72	2.0	U	I
Potassium 40	13966-00-2	U		0.88		U	GAM
Cobalt 60	10198-40-0	U		0.049	0.050	U	GAM
Tin 126	15832-50-5	U		0.065		U	GAM
Cesium 134	13967-70-9	U		0.055		U	GAM
Cesium 137	10045-97-3	U		0.047	0.10	U	GAM
Radium 226	13982-63-3	U		0.092		U	GAM
Radium 228	15262-20-1	U		0.22		U	GAM
Europium 152	14683-23-9	U		0.12	0.10	U	GAM
Europium 154	15585-10-1	U		0.16	0.10	U	GAM
Europium 155	14391-16-3	U		0.11	0.10	U	GAM
Thorium 228	14274-82-9	U		0.064		U	GAM
Thorium 232	TH-232	U		0.22		U	GAM

200-PW-2/200-PW-4 OU - Borehole Soil

Lab id EBRLNE
Protocol Hanford
Version Ver 1.0
Form DVD-DS
Version 3.06
Report date 08/04/03

EBERLINE SERVICES/RICHMOND

SAMPLE DELIVERY GROUP H2264

7538-003 **Method Blank**

BLANK, cont.

SDG 7538	Client/Case no Hanford	SDG H2264	
Contact Melissa C. Mannion	Contract No. 630		
Lab sample id R306068-03	Client sample id Method Blank		
Dept sample id 7538-003	Material/Matrix	SOLID	
	SAF No F03-006		

ANALYTE	CAS NO	RESULT pCi/g	2σ ERR (COUNT)	MDA pCi/g	RDL pCi/g	QUALI-FIERS	TEST
Uranium 235	15117-96-1	U		0.18		U	GAM
Uranium 238	U-238	U		6.2		U	GAM
Americium 241	14596-10-2	U		0.12		U	GAM

200-PW-2/200-PW-4 OU - Borehole Soil

QC-BLANK 44993

Lab id EBRLNE
Protocol Hanford
Version Ver 1.0
Form DVD-DS
Version 3.06
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EBERLINE SERVICES/RICHMOND

SAMPLE DELIVERY GROUP H2264

7538-002

Lab Control Sample

LAB CONTROL SAMPLE

SDG 7538
Contact Melissa C. Mannion

Client/Case no Hanford SDG H2264
Contract No. 630

Lab sample id R306068-02
Dept sample id 7538-002

Client sample id Lab Control Sample
Material/Matrix SOLID
SAF No F03-006

ANALYTE	RESULT pCi/g	2σ ERR (COUNT)	MDA pCi/g	RDL pCi/g	QUALI-FIERS	TEST	ADDED pCi/g	2σ ERR pCi/g	REC %	3σ LMTS (TOTAL)	PROTOCOL LIMITS
Tritium	12.5	0.39	0.26	400		H	12.9	0.52	97	84-116	80-120
Carbon 14	1410	28	6.2	50		C	1480	59	95	84-116	80-120
Nickel 63	212	4.5	2.4	30		NI_L	228	9.1	93	85-115	80-120
Total Strontium	21.0	0.96	0.34	1.0		SR	21.0	0.84	100	82-118	80-120
Technetium 99	118	2.6	0.57	15		TC	109	4.4	108	82-118	80-120
Thorium 230	38.6	2.8	0.32	1.0		TH	40.8	1.6	95	86-114	80-120
Total Uranium (ug/g)	17.2	2.0	0.042	1.0		U_T	16.5	0.66	104	76-124	80-120
Uranium 233/234	19.0	1.6	0.74	1.0		U	18.6	0.74	102	84-116	80-120
Uranium 235	14.7	1.4	0.15	1.0		U	15.1	0.60	97	83-117	80-120
Uranium 238	18.4	1.5	0.71	1.0		U	20.2	0.81	91	86-114	80-120
Neptunium 237	15.6	0.82	0.026	1.0		NP	19.9	0.80	78	90-110	80-120
Plutonium 238	22.6	2.2	0.19	1.0		PU	24.4	0.98	93	84-116	80-120
Plutonium 239/240	24.4	2.3	0.19	1.0		PU	26.4	1.1	92	84-116	80-120
Americium 241	18.6	2.1	0.24	1.0		AM	19.0	0.76	98	81-119	80-120
Iodine 129	124	1.4	1.4	2.0		I	116	4.6	107	83-117	80-120
Cobalt 60	3.64	0.15	0.068	0.050		GAM	3.37	0.13	108	74-126	80-120
Cesium 137	3.87	0.12	0.069	0.10		GAM	3.33	0.13	116	73-127	80-120

200-PW-2/200-PW-4 OU - Borehole Soil

QC-LCS 44992

Lab id EBRLNE
Protocol Hanford
Version Ver 1.0
Form DVD-LCS
Version 3.06
Report date 08/04/03

EBERLINE SERVICES/RICHMOND

SAMPLE DELIVERY GROUP H2264

7538-004 B161C2

DUPLICATE

SDG 7538 Client/Case no Hanford SDG H2264

Contact Melissa C. Mannion Contract No. 630

DUPLICATE		ORIGINAL			
Lab sample id	R306068-04	Lab sample id	R306068-01	Client sample id	B161C2
Dept sample id	7538-004	Dept sample id	7538-001	Location/Matrix	216-B-12 (C3246) SOLID
		Received	06/13/03	Collected/Weight	06/11/03 09:25 258.7 g
% solids	97.4	% solids	97.4	Custody/SAF No	F03-006-189 F03-006

ANALYTE	DUPLICATE pCi/g	2σ ERR (COUNT)	MDA pCi/g	RDL pCi/g	QUALIFIERS	TEST	ORIGINAL pCi/g	2σ ERR (COUNT)	MDA pCi/g	QUALIFIERS	RPD %	3σ PROT TOT LIMIT
Tritium	7.45	0.29	0.22	400		H	7.51	0.31	0.25		1	23
Carbon 14	-0.157	1.1	1.8	50	U	C	-0.588	1.1	2.0	U	-	
Nickel 63	-0.112	1.4	2.3	30	U	NI_L	-0.738	1.4	2.3	U	-	
Total Strontium	0.101	0.18	0.34	1.0	U	SR	-0.014	0.16	0.34	U	-	
Technetium 99	0.150	0.26	0.57	15	U	TC	0.362	0.29	0.62	U	-	
Thorium 228	0.393	0.17	0.19			TH	0.398	0.17	0.13		1	92
Thorium 230	0.358	0.21	0.29	1.0		TH	0.190	0.17	0.31	U	61	148
Thorium 232	0.392	0.17	0.13	1.0		TH	0.432	0.17	0.13		10	88
Total Uranium (ug/g)	2.85	0.33	0.042	1.0		U_T	2.89	0.34	0.042		1	31
Uranium 233/234	0.926	0.26	0.14	1.0		U	1.10	0.28	0.13		17	58
Uranium 235	0.067	0.090	0.17	1.0	U	U	0.042	0.083	0.16	U	-	
Uranium 238	1.11	0.30	0.14	1.0		U	0.996	0.28	0.13		11	59
Neptunium 237	0.004	0.008	0.011	1.0	U	NP	0.008	0.023	0.043	U	-	
Plutonium 238	0.053	0.054	0.20	1.0	U	PU	0	0.055	0.21	U	-	
Plutonium 239/240	0	0.053	0.20	1.0	U	PU	0.083	0.11	0.21	U	-	
Americium 241	-0.030	0.059	0.23	1.0	U	AM	-0.032	0.064	0.25	U	-	
Iodine 129	0.523	0.38	0.84	2.0	U	I	0.042	0.53	1.2	U	-	
Potassium 40	15.2	0.80	0.43			GAM	15.8	1.6	0.83		4	36
Cobalt 60	U		0.040	0.050	U	GAM	U		0.093	U	-	
Tin 126	U		0.12		U	GAM	U		0.12	U	-	
Cesium 134	U		0.048		U	GAM	U		0.11	U	-	
Cesium 137	U		0.035	0.10	U	GAM	U		0.081	U	-	
Radium 226	0.427	0.079	0.077			GAM	0.383	0.15	0.17		11	70
Radium 228	0.764	0.16	0.14			GAM	0.584	0.25	0.28		27	73
Europium 152	U		0.089	0.10	U	GAM	U		0.19	U	-	
Europium 154	U		0.12	0.10	U	GAM	U		0.30	U	-	
Europium 155	U		0.073	0.10	U	GAM	U		0.18	U	-	
Thorium 228	0.619	0.045	0.037			GAM	0.709	0.096	0.088		14	40

200-PW-2/200-PW-4 OU - Borehole Soil

Lab id EBRLNE
Protocol Hanford
Version Ver 1.0
Form DVD-DUP
Version 3.06
Report date 08/04/03

7538-004 B161C2

DUPLICATE, cont.

SDG	7538			Client/Case no	Hanford SDG H2264
Contact	Melissa C. Mannion			Contract	No. 630
	DUPLICATE		ORIGINAL		
Lab sample id	R306068-04	Lab sample id	R306068-01	Client sample id	B161C2
Dept sample id	7538-004	Dept sample id	7538-001	Location/Matrix	216-B-12 (C3246) SOLID
		Received	06/13/03	Collected/Weight	06/11/03 09:25 258.7 g
% solids	97.4	% solids	97.4	Custody/SAF No	F03-006-189 F03-006

ANALYTE	DUPLICATE pCi/g	2σ ERR (COUNT)	MDA pCi/g	RDL pCi/g	QUALI-FIERS	TEST	ORIGINAL pCi/g	2σ ERR (COUNT)	MDA pCi/g	QUALI-FIERS	RPD %	3σ PROT TOT LIMIT
Thorium 232	0.764	0.16	0.14			GAM	0.584	0.25	0.28		27	73
Uranium 235	U		0.12		U	GAM	U		0.30	U	-	
Uranium 238	U		5.0		U	GAM	U		12	U	-	
Americium 241	U		0.076		U	GAM	U		0.21	U	-	

200-PW-2/200-PW-4 OU - Borehole Soil

QC-DUP#1 44994

Lab id EBRLNE
Protocol Hanford
Version Ver 1.0
Form DVD-DUP
Version 3.06
Report date 08/04/03

EBERLINE SERVICES/RICHMOND

SAMPLE DELIVERY GROUP H2264

7538-005 B161C2

MATRIX SPIKE

SDG 7538		Client/Case no Hanford	SDG H2264
Contact Melissa C. Mannion		Contract No. 630	
MATRIX SPIKE	**ORIGINAL**		
Lab sample id R306068-05	Lab sample id R306068-01	Client sample id B161C2	
Dept sample id 7538-005	Dept sample id 7538-001	Location/Matrix 216-B-12 (C3246)	SOLID
	Received 06/13/03	Collected/Weight 06/11/03 09:25	258.7 g
% solids 97.4	% solids 97.4	Custody/SAF No F03-006-189	F03-006

ANALYTE	SPIKE pCi/g	2σ ERR (COUNT)	MDA pCi/g	RDL pCi/g	QUALI-FIERS	TEST	ADDED pCi/g	2σ ERR pCi/g	ORIGINAL pCi/g	2σ ERR (COUNT)	REC %	3σ LMTS (TOTAL)	PROTOCOL LIMITS
Tritium	52.7	0.74	0.25	400	X	H	50.3	2.0	7.51	0.31	90	83-117	60-140

200-PW-2/200-PW-4 OU - Borehole Soil

QC-MS#1 44995

Lab id EBRLNE
Protocol Hanford
Version Ver 1.0
Form DVD-MS
Version 3.06
Report date 08/04/03

EBERLINE SERVICES / RICHMOND

SAMPLE DELIVERY GROUP H2264

7538-001 B161C2

DATA SHEET

SDG	7538	Client/Case no	Hanford SDG H2264
Contact	Melissa C. Mannion	Contract	No. 630
Lab sample id	R306068-01	Client sample id	B161C2
Dept sample id	7538-001	Location/Matrix	216-B-12 (C3246) SOLID
Received	06/13/03	Collected/Weight	06/11/03 09:25 258.7 g
% solids	97.4	Custody/SAF No	F03-006-189 F03-006

ANALYTE	CAS NO	RESULT pCi/g	2σ ERR (COUNT)	MDA pCi/g	RDL pCi/g	QUALI-FIERS	TEST
Tritium	10028-17-8	7.51	0.31	0.25	400		H
Carbon 14	14762-75-5	-0.588	1.1	2.0	50	U	C
Nickel 63	13981-37-8	-0.738	1.4	2.3	30	U	NI_L
Total Strontium	SR-RAD	-0.014	0.16	0.34	1.0	U	SR
Technetium 99	14133-76-7	0.362	0.29	0.62	15	U	TC
Thorium 228	14274-82-9	0.398	0.17	0.13			TH
Thorium 230	14269-63-7	0.190	0.17	0.31	1.0	U	TH
Thorium 232	TH-232	0.432	0.17	0.13	1.0		TH
Total Uranium (ug/g)	7440-61-1	2.89	0.34	0.042	1.0		U_T
Uranium 233/234	U-233/234	1.10	0.28	0.13	1.0		U
Uranium 235	15117-96-1	0.042	0.083	0.16	1.0	U	U
Uranium 238	U-238	0.996	0.28	0.13	1.0		U.
Neptunium 237	13994-20-2	0.008	0.023	0.043	1.0	U	NP
Plutonium 238	13981-16-3	0	0.055	0.21	1.0	U	PU
Plutonium 239/240	PU-239/240	0.083	0.11	0.21	1.0	U	PU
Americium 241	14596-10-2	-0.032	0.064	0.25	1.0	U	AM
Iodine 129	15046-84-1	0.042	0.53	1.2	2.0	U	I
Potassium 40	13966-00-2	15.8	1.6	0.83			GAM
Cobalt 60	10198-40-0	U		0.093	0.050	U	GAM
Tin 126	15832-50-5	U		0.12		U	GAM
Cesium 134	13967-70-9	U		0.11		U	GAM
Cesium 137	10045-97-3	U		0.081	0.10	U	GAM
Radium 226	13982-63-3	0.383	0.15	0.17			GAM
Radium 228	15262-20-1	0.584	0.25	0.28			GAM
Europium 152	14683-23-9	U		0.19	0.10	U	GAM
Europium 154	15585-10-1	U		0.30	0.10	U	GAM
Europium 155	14391-16-3	U		0.18	0.10	U	GAM
Thorium 228	14274-82-9	0.709	0.096	0.088			GAM

200-PW-2/200-PW-4 OU - Borehole Soil

Lab id	EBRLNE
Protocol	Hanford
Version	Ver 1.0
Form	DVD-DS
Version	3.06
Report date	08/04/03

DATA SHEET, cont

SDG	7538	Client/Case no	Hanford SDG H2264
Contact	Melissa C. Mannion	Contract	No. 630
Lab sample id	R306068-01	Client sample id	B161C2
Dept sample id	7538-001	Location/Matrix	216-B-12 (C3246) SOLID
Received	06/13/03	Collected/Weight	06/11/03 09:25 258.7 g
% solids	97.4	Custody/SAF No	F03-006-189 F03-006

ANALYTE	CAS NO	RESULT pCi/g	2σ ERR (COUNT)	MDA pCi/g	RDL pCi/g	QUALI-FIERS	TEST
Thorium 232	TH-232	0.584	0.25	0.28			GAM
Uranium 235	15117-96-1	U		0.30		U	GAM
Uranium 238	U-238	U		12		U	GAM
Americium 241	14596-10-2	U		0.21		U	GAM

200-PW-2/200-PW-4 OU - Borehole Soil

Lab id	EBRLNE
Protocol	Hanford
Version	Ver 1.0
Form	DVD-DS
Version	3.06
Report date	08/04/03

EBERLINE SERVICES/RICHMOND

SAMPLE DELIVERY GROUP H2264

Test AM Matrix SOLID
SDG 7538
Contact Melissa C. Mannion

LAB METHOD SUMMARY

AMERICIUM 241 IN SOIL
ALPHA SPECTROSCOPY

Client Hanford
Contract No. 630
Contract SDG H2264

RESULTS

LAB SAMPLE ID	RAW TEST	SUF-FIX	PLANCHET	CLIENT SAMPLE ID	Americium 241	
Preparation batch 7071-086						
R306068-01			7538-001	B161C2	U	
R306068-02			7538-002	LCS (QC ID=44992)	ok	
R306068-03			7538-003	BLK (QC ID=44993)	U	
R306068-04			7538-004	Duplicate (R306068-01)	-	U
Nominal values and limits from method				RDLs (pCi/g)	1.0	
200-PW-2/200-PW-4 OU - Borehole Soil						

METHOD PERFORMANCE

LAB SAMPLE ID	RAW TEST	SUF-FIX	CLIENT SAMPLE ID	MDA pCi/g	ALIQ g	PREP FAC	DILU-TION	YIELD %	EFF %	COUNT min	FWHM keV	DRIFT KeV	DAYS HELD	PREPARED	ANAL-YZED	DETECTOR
Preparation batch 7071-086			2σ prep error 5.0 %	Reference Lab Notebook 7071 pg. 086												
R306068-01			B161C2	0.25	0.500			70	111				40	07/21/03	07/21	SS-028
R306068-02			LCS (QC ID=44992)	0.24	0.500			73	111					07/21/03	07/21	SS-029
R306068-03			BLK (QC ID=44993)	0.26	0.500			69	113					07/21/03	07/21	SS-042
R306068-04			Duplicate (R306068-01) (QC ID=44994)	0.23	0.500			79	113				40	07/21/03	07/21	SS-051
Nominal values and limits from method				1.0	0.500			20-105	100	100			180			

PROCEDURES	REFERENCE	
	AMCMISO_IE_PLATE_AEA	
	CP-060	Soil Preparation, rev 4
	CP-071	Soil Dissolution, > 1.0g Aliquot, rev 2
	CP-963	Americium and Curium in Water and Dissolved Samples by Extraction Chromatography, rev 3
	CP-008	Heavy Element Electroplating, rev 7

AVERAGES ± 2 SD FOR 4 SAMPLES			
	MDA	0.24	± 0.026
	YIELD	73	± 9

Lab id EBRLNE
Protocol Hanford
Version Ver 1.0
Form DVD-LMS
Version 3.06
Report date 08/04/03

EBERLINE SERVICES/RICHMOND

SAMPLE DELIVERY GROUP H2264

Test NP Matrix SOLID
SDG 7538
Contact Melissa C. Mannion

LAB METHOD SUMMARY

NEPTUNIUM IN SOIL
ALPHA SPECTROSCOPY

Client Hanford
Contract No. 630
Contract SDG H2264

RESULTS

LAB SAMPLE ID	RAW TEST	SUF-FIX	PLANCHET	CLIENT SAMPLE ID	Neptunium 237
Preparation batch 7071-086					
R306068-01			7538-001	B161C2	U
R306068-02			7538-002	LCS (QC ID=44992)	LOW
R306068-03			7538-003	BLK (QC ID=44993)	U
R306068-04			7538-004	Duplicate (R306068-01)	- U
Nominal values and limits from method				RDLs (pCi/g)	1.0
200-PW-2/200-PW-4 OU - Borehole Soil					

METHOD PERFORMANCE

LAB SAMPLE ID	RAW TEST	SUF-FIX	CLIENT SAMPLE ID	MDA pCi/g	ALIQ g	PREP FAC	DILU-TION	YIELD %	EFF %	COUNT min	FWHM keV	DRIFT KeV	DAYS HELD	PREPARED	ANAL-YZED	DETECTOR
Preparation batch 7071-086			2σ prep error 5.0 %		Reference Lab Notebook 7071 pg. 086											
R306068-01			B161C2	0.043	0.500			62		1045			41	07/22/03	07/22	SS-028
R306068-02			LCS (QC ID=44992)	0.026	0.500			71		1046				07/22/03	07/22	SS-029
R306068-03			BLK (QC ID=44993)	0.042	0.500			66		1052				07/22/03	07/22	SS-042
R306068-04			Duplicate (R306068-01) (QC ID=44994)	0.011	0.500			65		1052			41	07/22/03	07/22	SS-051
Nominal values and limits from method				1.0	0.500			20-105		100			180			

PROCEDURES	REFERENCE	
	NP237_LLE_PLATE_AEA	
	CP-060	Soil Preparation, rev 4
	CP-071	Soil Dissolution, > 1.0g Aliquot, rev 2
	CP-930	Neptunium from Solids and Water by Extraction Chromatography, rev 0
	CP-008	Heavy Element Electroplating, rev 7

AVERAGES ± 2 SD FOR 4 SAMPLES	MDA	0.030 ± 0.030
	YIELD	66 ± 7

Lab id EBRLNE
Protocol Hanford
Version Ver 1.0
Form DVD-LMS
Version 3.06
Report date 08/04/03

EBERLINE SERVICES/RICHMOND

SAMPLE DELIVERY GROUP H2264

Test PU Matrix SOLID
SDG 7538
Contact Melissa C. Mannion

LAB METHOD SUMMARY

PLUTONIUM, ISOTOPIC IN SOLIDS
ALPHA SPECTROSCOPY

Client Hanford
Contract No. 630
Contract SDG H2264

RESULTS

LAB SAMPLE ID	RAW TEST	SUF-FIX	PLANCHET	CLIENT SAMPLE ID	Plutonium 238		Plutonium 239/240	
Preparation batch 7071-086								
R306068-01			7538-001	B161C2	U		U	
R306068-02			7538-002	LCS (QC ID=44992)	ok		ok	
R306068-03			7538-003	BLK (QC ID=44993)	U		U	
R306068-04			7538-004	Duplicate (R306068-01)	-	U	-	U
Nominal values and limits from method				RDLs (pCi/g)	1.0		1.0	
200-PW-2/200-PW-4 OU - Borehole Soil								

METHOD PERFORMANCE

LAB SAMPLE ID	RAW TEST	SUF-FIX	CLIENT SAMPLE ID	MAX MDA pCi/g	ALIQ g	PREP FAC	DILU-TION	YIELD %	EFF %	COUNT min	FWHM keV	DRIFT KeV	DAYS HELD	PREPARED	ANAL-YZED	DETECTOR
Preparation batch 7071-086			2σ prep error 5.0 %	Reference Lab Notebook 7071 pg. 086												
R306068-01			B161C2	0.21	0.500			72		126			42	07/22/03	07/23	SS-028
R306068-02			LCS (QC ID=44992)	0.19	0.500			80		127				07/22/03	07/23	SS-029
R306068-03			BLK (QC ID=44993)	0.19	0.500			84		128				07/22/03	07/23	SS-042
R306068-04			Duplicate (R306068-01) (QC ID=44994)	0.20	0.500			77		128			42	07/22/03	07/23	SS-051
Nominal values and limits from method				1.0	0.500			20-105		100	100		180			

PROCEDURES	REFERENCE	PUISO_PLATE_AEA
	CP-060	Soil Preparation, rev 4
	CP-071	Soil Dissolution, > 1.0g Aliquot, rev 2
	CP-941	Plutonium in Water and Dissolved Samples by Extraction Chromatography, rev 1
	CP-008	Heavy Element Electroplating, rev 7

AVERAGES ± 2 SD FOR 4 SAMPLES				
	MDA	0.20	±	0.019
	YIELD	78	±	10

Lab id EBRLNE
Protocol Hanford
Version Ver 1.0
Form DVD-LMS
Version 3.06
Report date 08/04/03

EBERLINE SERVICES/RICHMOND

SAMPLE DELIVERY GROUP H2264

Test TH Matrix SOLID
SDG 7538
Contact Melissa C. Mannion

LAB METHOD SUMMARY

THORIUM, ISOTOPIC IN SOIL
ALPHA SPECTROSCOPY

Client Hanford
Contract No. 630
Contract SDG H2264

RESULTS

LAB SAMPLE ID	RAW TEST	SUF-FIX	PLANCHET	CLIENT SAMPLE ID	Thorium 230
Preparation batch 7071-086					
R306068-01			7538-001	B161C2	U
R306068-02			7538-002	LCS (QC ID=44992)	ok
R306068-03			7538-003	BLK (QC ID=44993)	U
R306068-04			7538-004	Duplicate (R306068-01)	ok
Nominal values and limits from method				RDLs (pCi/g)	1.0
200-PW-2/200-PW-4 OU - Borehole Soil					

METHOD PERFORMANCE

LAB SAMPLE ID	RAW TEST	SUF-FIX	CLIENT SAMPLE ID	MAX MDA pCi/g	ALIQ g	PREP FAC	DILU-TION	YIELD %	EFF %	COUNT min	FWHM keV	DRIFT KeV	DAYS HELD	PREPARED	ANAL-YZED	DETECTOR
Preparation batch 7071-086			2σ prep error 5.0 %	Reference Lab Notebook 7071 pg. 086												
R306068-01			B161C2	0.31	0.250			92		316			42	07/22/03	07/23	SS-028
R306068-02			LCS (QC ID=44992)	0.32	0.250			90		316				07/22/03	07/23	SS-029
R306068-03			BLK (QC ID=44993)	0.32	0.250			87		318				07/22/03	07/23	SS-042
R306068-04			Duplicate (R306068-01) (QC ID=44994)	0.29	0.250			89		318			42	07/22/03	07/23	SS-052
Nominal values and limits from method				1.0	0.250			20-105		150			180			

PROCEDURES	REFERENCE	THISO_IE_PLATE_AEA
	CP-060	Soil Preparation, rev 4
	CP-071	Soil Dissolution, > 1.0g Aliquot, rev 2
	CP-900	Thorium in Water and Dissolved Solid Samples by Extraction Chromatography, rev 1
	CP-008	Heavy Element Electroplating, rev 7

AVERAGES ± 2 SD FOR 4 SAMPLES
MDA 0.31 ± 0.028
YIELD 90 ± 4

Lab id EBRLNE
Protocol Hanford
Version Ver 1.0
Form DVD-LMS
Version 3.06
Report date 08/04/03

EBERLINE SERVICES/RICHMOND

SAMPLE DELIVERY GROUP H2264

Test U Matrix SOLID
SDG 7538
Contact Melissa C. Mannion

LAB METHOD SUMMARY

URANIUM, ISOTOPIC IN SOIL
ALPHA SPECTROSCOPY

Client Hanford
Contract No. 630
Contract SDG H2264

RESULTS

LAB SAMPLE ID	RAW TEST	SUF-FIX	PLANCHET	CLIENT SAMPLE ID	1: Uranium 233/234	2: Uranium 235	3: Uranium 238	RESULT RATIOS (%) 1÷3	2σ	2÷3	2σ
Preparation batch 7071-086											
R306068-01			7538-001	B161C2	1.10	U	0.996	110	42	4	8
R306068-02			7538-002	LCS (QC ID=44992)	ok	ok	ok				
R306068-03			7538-003	BLK (QC ID=44993)	U	U	U				
R306068-04			7538-004	Duplicate (R306068-01)	ok	- U	ok	83	33	6	8
Nominal values and limits from method				RDLs (pCi/g)	1.0	1.0	1.0	100		4	
200-PW-2/200-PW-4 OU - Borehole Soil							Averages	97		5	

METHOD PERFORMANCE

LAB SAMPLE ID	RAW TEST	SUF-FIX	CLIENT SAMPLE ID	MAX MDA pCi/g	ALIQ g	PREP FAC	DILU-TION	YIELD %	EFF %	COUNT min	FWHM keV	DRIFT KeV	DAYS HELD	PREPARED	ANAL-YZED	DETECTOR
Preparation batch 7071-086			2σ prep error 5.0 %	Reference Lab Notebook 7071 pg. 086												
R306068-01			B161C2	0.16	0.500			83		177			41	07/22/03	07/22	SS-028
R306068-02			LCS (QC ID=44992)	0.74	0.500			87		178				07/22/03	07/22	SS-029
R306068-03			BLK (QC ID=44993)	0.18	0.500			80		176				07/22/03	07/22	SS-062
R306068-04			Duplicate (R306068-01) (QC ID=44994)	0.17	0.500			81		175			41	07/22/03	07/22	SS-042
Nominal values and limits from method				1.0	0.500			20-105		100	100		180			

PROCEDURES	REFERENCE	
	UISO_PLATE_AEA	
	CP-071	Soil Dissolution, > 1.0g Aliquot, rev 2
	CP-921	Uranium in Water and Dissolved Samples by Extraction Chromatography, rev 0
	CP-008	Heavy Element Electroplating, rev 7

AVERAGES ± 2 SD FOR 4 SAMPLES			
	MDA	0.31	± 0.57
	YIELD	83	± 6

Lab id EBRLNE
Protocol Hanford
Version Ver 1.0
Form DVD-LMS
Version 3.06
Report date 08/04/03

EBERLINE SERVICES/RICHMOND

SAMPLE DELIVERY GROUP H2264

Test	SR Matrix SOLID
SDG	7538
Contact	Melissa C. Mannion

LAB METHOD SUMMARY

TOTAL STRONTIUM IN SOIL

BETA COUNTING

Client	Hanford
Contract	No. 630
Contract	SDG H2264

RESULTS

LAB SAMPLE ID	RAW TEST	SUF-FIX	PLANCHET	CLIENT SAMPLE ID	Total Strontium
Preparation batch 7071-086					
R306068-01			7538-001	B161C2	U
R306068-02			7538-002	LCS (QC ID=44992)	ok
R306068-03			7538-003	BLK (QC ID=44993)	U
R306068-04			7538-004	Duplicate (R306068-01)	- U
Nominal values and limits from method				RDLs (pCi/g)	1.0
200-PW-2/200-PW-4 OU - Borehole Soil					

METHOD PERFORMANCE

LAB SAMPLE ID	RAW TEST	SUF-FIX	CLIENT SAMPLE ID	MDA pCi/g	ALIQ g	PREP FAC	DILU-TION	YIELD %	EFF %	COUNT min	FWHM keV	DRIFT KeV	DAYS HELD	PREPARED	ANAL-YZED	DETECTOR
Preparation batch 7071-086			2σ prep error 10.0 %	Reference Lab Notebook 7071 pg. 086												
R306068-01			B161C2	0.34	1.00			98	100				37	07/18/03	07/18	GRB-218
R306068-02			LCS (QC ID=44992)	0.34	1.00			79	100					07/18/03	07/18	GRB-217
R306068-03			BLK (QC ID=44993)	0.44	1.00			75	100					07/18/03	07/18	GRB-221
R306068-04			Duplicate (R306068-01) (QC ID=44994)	0.34	1.00			93	100				37	07/18/03	07/18	GRB-222
Nominal values and limits from method				1.0	1.00			30-105	100				180			

PROCEDURES	REFERENCE	
	SRTOT_SEP_PRECIP_GPC	
	CP-071	Soil Dissolution, > 1.0g Aliquot, rev 2
	CP-381	Strontium in Solids, rev 1

AVERAGES ± 2 SD FOR 4 SAMPLES				
	MDA	0.36	±	0.10
	YIELD	86	±	22

Lab id	EBRLNE
Protocol	Hanford
Version	Ver 1.0
Form	DVD-LMS
Version	3.06
Report date	08/04/03

EBERLINE SERVICES/RICHMOND

SAMPLE DELIVERY GROUP H2264

Test TC Matrix SOLID
SDG 7538
Contact Melissa C. Mannion

LAB METHOD SUMMARY

TECHNETIUM 99 IN SOIL
BETA COUNTING

Client Hanford
Contract No. 630
Contract SDG H2264

RESULTS

LAB SAMPLE ID	RAW TEST	SUF-FIX	PLANCHET	CLIENT SAMPLE ID	Technetium 99	
Preparation batch 7071-086						
R306068-01			7538-001	B161C2	U	
R306068-02			7538-002	LCS (QC ID=44992)	ok	
R306068-03			7538-003	BLK (QC ID=44993)	U	
R306068-04			7538-004	Duplicate (R306068-01)	-	U
Nominal values and limits from method				RDLs (pCi/g)	15	
200-PW-2/200-PW-4 OU - Borehole Soil						

METHOD PERFORMANCE

LAB SAMPLE ID	RAW TEST	SUF-FIX	CLIENT SAMPLE ID	MDA pCi/g	ALIQ g	PREP FAC	DILU-TION	YIELD %	EFF %	COUNT min	FWHM keV	DRIFT KeV	DAYS HELD	PREPARED	ANAL-YZED	DETECTOR
Preparation batch 7071-086			2σ prep error 10.0 %	Reference Lab Notebook 7071 pg. 086												
R306068-01			B161C2	0.62	1.02			80		50			47	07/22/03	07/28	GRB-222
R306068-02			LCS (QC ID=44992)	0.57	1.00			90		50				07/22/03	07/25	GRB-218
R306068-03			BLK (QC ID=44993)	0.56	1.00			91		50				07/22/03	07/26	GRB-203
R306068-04			Duplicate (R306068-01) (QC ID=44994)	0.57	1.02			85		50			44	07/22/03	07/25	GRB-220
Nominal values and limits from method				15	1.00			20-105		50			180			

PROCEDURES	REFERENCE	TC99_TR_SEP_LSC
	CP-071	Soil Dissolution, > 1.0g Aliquot, rev 2
	CP-021	Preparation of Tc-99m Tracer, rev 2
	CP-002	Q.C. Preparation, rev 4
	CP-003	Addition of Carriers and Tracers, rev 5
	CP-542	Technetium-99 Purification (Soil) by Extraction Chromatography, rev 2
	CP-008	Heavy Element Electroplating, rev 7

AVERAGES ± 2 SD FOR 4 SAMPLES				
	MDA	0.58	±	0.054
	YIELD	86	±	10

Lab id EBRLNE
Protocol Hanford
Version Ver 1.0
Form DVD-LMS
Version 3.06
Report date 08/04/03

EBERLINE SERVICES/RICHMOND

SAMPLE DELIVERY GROUP H2264

Test GAM Matrix SOLID
SDG 7538
Contact Melissa C. Mannion

LAB METHOD SUMMARY

GAMMA SCAN
GAMMA SPECTROSCOPY

Client Hanford
Contract No. 630
Contract SDG H2264

RESULTS

LAB SAMPLE ID	RAW TEST	SUF-FIX	PLANCHET	CLIENT SAMPLE ID	Cobalt 60		Cesium 137	
Preparation batch 7071-086								
R306068-01			7538-001	B161C2	U		U	
R306068-02			7538-002	LCS (QC ID=44992)	ok		ok	
R306068-03			7538-003	BLK (QC ID=44993)	U		U	
R306068-04			7538-004	Duplicate (R306068-01)	-	U	-	U
Nominal values and limits from method				RDLs (pCi/g)	0.050		0.10	
200-PW-2/200-PW-4 OU - Borehole Soil								

METHOD PERFORMANCE

LAB SAMPLE ID	RAW TEST	SUF-FIX	CLIENT SAMPLE ID	MDA pCi/g	ALIQ g	PREP FAC	DILU-TION	YIELD %	EFF %	COUNT min	FWHM keV	DRIFT KeV	DAYS HELD	PREPARED	ANAL-YZED	DETECTOR
Preparation batch 7071-086			2σ prep error 15.0 %	Reference Lab Notebook 7071 pg. 086												
R306068-01			B161C2	0.69	69.7					461			16	06/26/03	06/27	PD,03,00
R306068-02			LCS (QC ID=44992)	0.068	69.7					484				06/26/03	06/27	PD,04,00
R306068-03			BLK (QC ID=44993)	0.42	69.7					792				06/26/03	06/28	PD,03,00
R306068-04			Duplicate (R306068-01) (QC ID=44994)	0.29	69.7					768			17	06/26/03	06/28	PD,04,00
Nominal values and limits from method				0.050	69.7					100			180			

PROCEDURES	REFERENCE	GAMMA_GS
	CP-060	Soil Preparation, rev 4
	CP-100	Ge(Li) Preparation for Commercial Samples, rev 5

AVERAGES ± 2 SD FOR 4 SAMPLES
MDA 0.37 ± 0.52
YIELD ____ ± ____

Lab id EBRLNE
Protocol Hanford
Version Ver 1.0
Form DVD-LMS
Version 3.06
Report date 08/04/03

EBERLINE SERVICES/RICHMOND

SAMPLE DELIVERY GROUP H2264

Test I Matrix SOLID
SDG 7538
Contact Melissa C. Mannion

LAB METHOD SUMMARY

IODINE 129 IN SOIL
GAMMA SPECTROSCOPY

Client Hanford
Contract No. 630
Contract SDG H2264

RESULTS

LAB SAMPLE ID	RAW TEST	SUF-FIX	PLANCHET	CLIENT SAMPLE ID	Iodine 129	
Preparation batch 7071-086						
R306068-01			7538-001	B161C2	U	
R306068-02			7538-002	LCS (QC ID=44992)	ok	
R306068-03			7538-003	BLK (QC ID=44993)	U	
R306068-04			7538-004	Duplicate (R306068-01)	-	U
Nominal values and limits from method 200-PW-2/200-PW-4 OU - Borehole Soil				RDLs (pCi/g)	2.0	

METHOD PERFORMANCE

LAB SAMPLE ID	RAW TEST	SUF-FIX	CLIENT SAMPLE ID	MDA pCi/g	ALIQ g	PREP FAC	DILU-TION	YIELD %	EFF %	COUNT min	FWHM keV	DRIFT KeV	DAYS HELD	PREPARED	ANAL-YZED	DETECTOR
Preparation batch 7071-086 2σ prep error 10.0 % Reference Lab Notebook 7071 pg. 086																
R306068-01			B161C2	1.2	1.02			56		707			43	07/22/03	07/24	XSPEC-004
R306068-02			LCS (QC ID=44992)	1.4	1.00			92		612				07/22/03	07/28	XSPEC-004
R306068-03			BLK (QC ID=44993)	0.72	1.00			92		623				07/22/03	07/25	XSPEC-004
R306068-04			Duplicate (R306068-01) (QC ID=44994)	0.84	1.02			47		1321			44	07/22/03	07/25	XSPEC-004
Nominal values and limits from method				2.0	1.00			20-105		300			180			

PROCEDURES	REFERENCE	
	I129_SEP_LEPS_GS	
	CP-024	Iodine-129, Sample Dissolution, rev 3
	CP-530	Iodine-129 Purification, rev 0

AVERAGES ± 2 SD FOR 4 SAMPLES			
	MDA	1.0	± 0.63
	YIELD	72	± 47

Lab id EBRLNE
Protocol Hanford
Version Ver 1.0
Form DVD-LMS
Version 3.06
Report date 08/04/03

EBERLINE SERVICES/RICHMOND

SAMPLE DELIVERY GROUP H2264

Test U_T Matrix SOLID
SDG 7538
Contact Melissa C. Mannion

LAB METHOD SUMMARY

URANIUM, TOTAL IN SOIL
KINETIC PHOSPHORIMETRY (KPA)

Client Hanford
Contract No. 630
Contract SDG H2264

RESULTS

LAB SAMPLE ID	RAW TEST	SUF-FIX	PLANCHET	CLIENT SAMPLE ID	Total Uranium
Preparation batch 7071-086					
R306068-01			7538-001	B161C2	2.89
R306068-02			7538-002	LCS (QC ID=44992)	ok
R306068-03			7538-003	BLK (QC ID=44993)	U
R306068-04			7538-004	Duplicate (R306068-01)	ok
Nominal values and limits from method 200-PW-2/200-PW-4 OU - Borehole Soil				RDLs (ug/g)	1.0

METHOD PERFORMANCE

LAB SAMPLE ID	RAW TEST	SUF-FIX	CLIENT SAMPLE ID	MDA ug/g	ALIQ g	PREP FAC	DILU-TION	YIELD %	EFF %	COUNT min	FWHM keV	DRIFT KeV	DAYS HELD	PREPARED	ANAL-YZED	DETECTOR
Preparation batch 7071-086 2σ prep error 9.0 % Reference Lab Notebook 7071 pg. 086																
R306068-01			B161C2	0.042	0.100								22	07/03/03	07/03	KPA-001
R306068-02			LCS (QC ID=44992)	0.042	0.100									07/03/03	07/03	KPA-001
R306068-03			BLK (QC ID=44993)	0.004	0.100									07/03/03	07/03	KPA-001
R306068-04			Duplicate (R306068-01) (QC ID=44994)	0.042	0.100								22	07/03/03	07/03	KPA-001
Nominal values and limits from method				1.0	0.100								180			

PROCEDURES	REFERENCE	UTOT_KPA
	CP-060	Soil Preparation, rev 4
	CP-071	Soil Dissolution, > 1.0g Aliquot, rev 2
	CP-044	Sample Preparation for Total Uranium by Kinetic Phosphorimetry, rev 4
	CP-928	Total Uranium by Kinetic Phosphorimetry, rev 5

AVERAGES ± 2 SD FOR 4 SAMPLES
MDA 0.032 ± 0.038
YIELD _____ ± _____

Lab id EBRLNE
Protocol Hanford
Version Ver 1.0
Form DVD-LMS
Version 3.06
Report date 08/04/03

EBERLINE SERVICES/RICHMOND

SAMPLE DELIVERY GROUP H2264

Test C Matrix SOLID
SDG 7538
Contact Melissa C. Mannion

LAB METHOD SUMMARY

CARBON 14 IN SOIL
LIQUID SCINTILLATION COUNTING

Client Hanford
Contract No. 630
Contract SDG H2264

RESULTS

LAB SAMPLE ID	RAW TEST	SUF-FIX	PLANCHET	CLIENT SAMPLE ID	Carbon 14	
Preparation batch 7071-086						
R306068-01			7538-001	B161C2	U	
R306068-02			7538-002	LCS (QC ID=44992)	ok	
R306068-03			7538-003	BLK (QC ID=44993)	U	
R306068-04			7538-004	Duplicate (R306068-01)	-	U
Nominal values and limits from method				RDLs (pCi/g)	50	
200-PW-2/200-PW-4 OU - Borehole Soil						

METHOD PERFORMANCE

LAB SAMPLE ID	RAW TEST	SUF-FIX	CLIENT SAMPLE ID	MDA pCi/g	ALIQ g	PREP FAC	DILU-TION	YIELD %	EFF %	COUNT min	FWHM keV	DRIFT KeV	DAYS HELD	PREPARED	ANAL-YZED	DETECTOR
Preparation batch 7071-086			2σ prep error 10.0 %	Reference Lab Notebook 7071 pg. 086												
R306068-01			B161C2	2.0	0.431			100		100			37	07/16/03	07/18	LSC-005
R306068-02			LCS (QC ID=44992)	6.2	0.431			100		11				07/16/03	07/18	LSC-005
R306068-03			BLK (QC ID=44993)	2.0	0.431			100		100				07/16/03	07/18	LSC-005
R306068-04			Duplicate (R306068-01) (QC ID=44994)	1.8	0.474			100		100			37	07/16/03	07/18	LSC-005
Nominal values and limits from method				50	0.431					50			180			

PROCEDURES REFERENCE C14_COX_LSC
CP-251 Tritium/Carbon-14 Oxidation, rev 5

AVERAGES ± 2 SD FOR 4 SAMPLES
MDA 3.0 ± 4.3
YIELD 100 ± 0

Lab id EBRLNE
Protocol Hanford
Version Ver 1.0
Form DVD-LMS
Version 3.06
Report date 08/04/03

EBERLINE SERVICES/RICHMOND

SAMPLE DELIVERY GROUP H2264

Test H Matrix SOLID
SDG 7538
Contact Melissa C. Mannion

LAB METHOD SUMMARY

TRITIUM IN SOIL
LIQUID SCINTILLATION COUNTING

Client Hanford
Contract No. 630
Contract SDG H2264

RESULTS

LAB SAMPLE ID	RAW TEST	SUF-FIX	PLANCHET	CLIENT SAMPLE ID	Tritium	
Preparation batch 7071-086						
R306068-01			7538-001	B161C2	7.51	
R306068-02			7538-002	LCS (QC ID=44992)	ok	
R306068-03			7538-003	BLK (QC ID=44993)	U	
R306068-04			7538-004	Duplicate (R306068-01)	ok	
R306068-05			7538-005	Spike (R306068-01)	ok	X
Nominal values and limits from method				RDLs (pCi/g)	400	
200-PW-2/200-PW-4 OU - Borehole Soil						

METHOD PERFORMANCE

LAB SAMPLE ID	RAW TEST	SUF-FIX	CLIENT SAMPLE ID	MDA pCi/g	ALIQ g	PREP FAC	DILU-TION	YIELD %	EFF %	COUNT min	FWHM keV	DRIFT KeV	DAYS HELD	PREPARED	ANAL-YZED	DETECTOR
Preparation batch 7071-086			2σ prep error 10.0 %	Reference Lab Notebook 7071 pg. 086												
R306068-01			B161C2	0.25	20.6			35		120			43	07/24/03	07/24	LSC-007
R306068-02			LCS (QC ID=44992)	0.26	20.0			33		120				07/24/03	07/24	LSC-007
R306068-03			BLK (QC ID=44993)	0.26	20.0			33		120				07/24/03	07/25	LSC-007
R306068-04			Duplicate (R306068-01) (QC ID=44994)	0.22	21.9			35		120			44	07/24/03	07/25	LSC-007
R306068-05			Spike (R306068-01) (QC ID=44995)	0.25	20.6			35		120			44	07/24/03	07/25	LSC-007
Nominal values and limits from method				400	20.0					25			180			

PROCEDURES REFERENCE 906.0_H3_LSC
CP-216 Tritium in Solid Samples by Azeotropic Distillation, rev 6

AVERAGES ± 2 SD FOR 5 SAMPLES
MDA 0.25 ± 0.033
YIELD 34 ± 2

Lab id EBRLNE
Protocol Hanford
Version Ver 1.0
Form DVD-LMS
Version 3.06
Report date 08/04/03

EBERLINE SERVICES/RICHMOND

SAMPLE DELIVERY GROUP H2264

Test NI_L Matrix SOLID
SDG 7538
Contact Melissa C. Mannion

LAB METHOD SUMMARY

NICKEL 63 IN SOIL
LIQUID SCINTILLATION COUNTING

Client Hanford
Contract No. 630
Contract SDG H2264

RESULTS

LAB SAMPLE ID	RAW TEST	SUF-FIX	PLANCHET	CLIENT SAMPLE ID	Nickel 63	
Preparation batch 7071-086						
R306068-01			7538-001	B161C2	U	
R306068-02			7538-002	LCS (QC ID=44992)	ok	
R306068-03			7538-003	BLK (QC ID=44993)	U	
R306068-04			7538-004	Duplicate (R306068-01)	-	U
Nominal values and limits from method				RDLs (pCi/g)	30	
200-PW-2/200-PW-4 OU - Borehole Soil						

METHOD PERFORMANCE

LAB SAMPLE ID	RAW TEST	SUF-FIX	CLIENT SAMPLE ID	MDA pCi/g	ALIQ g	PREP FAC	DILU-TION	YIELD %	EFF %	COUNT min	FWHM keV	DRIFT KeV	DAYS HELD	PREPARED	ANAL-YZED	DETECTOR
Preparation batch 7071-086			2σ prep error 10.0 %		Reference Lab Notebook 7071 pg. 086											
R306068-01			B161C2	2.3	0.500			89	100				37	07/18/03	07/18	LSC-004
R306068-02			LCS (QC ID=44992)	2.4	0.500			100	74					07/18/03	07/19	LSC-004
R306068-03			BLK (QC ID=44993)	2.0	0.500			100	100					07/18/03	07/19	LSC-004
R306068-04			Duplicate (R306068-01) (QC ID=44994)	2.3	0.500			95	100				38	07/18/03	07/19	LSC-004
Nominal values and limits from method				30	0.500			30-105	50				180			

PROCEDURES	REFERENCE	
	NI63_LSC	
	CP-060	Soil Preparation, rev 4
	CP-071	Soil Dissolution, > 1.0g Aliquot, rev 2
	CP-281	Nickel-63 Purification By Extraction Chromatography, rev 0

AVERAGES ± 2 SD FOR 4 SAMPLES			
	MDA	2.2	± 0.35
	YIELD	96	± 10

Lab id EBRLNE
Protocol Hanford
Version Ver 1.0
Form DVD-LMS
Version 3.06
Report date 08/04/03

EBERLINE SERVICES/RICHMOND

SAMPLE DELIVERY GROUP H2264

SDG 7538
Contact Melissa C. Mannion

REPORT GUIDE

Client Hanford
Contract No. 630
Case no SDG_H2264

SAMPLE SUMMARY

The Sample and QC Summary Reports show all samples, including QC samples, reported in one Sample Delivery Group (SDG).

The Sample Summary Report fully identifies client samples and gives the corresponding lab sample identification. The QC Summary Report shows at the sample level how the lab organized the samples into batches and generated QC samples. The Preparation Batch and Method Summary Reports show this at the analysis level.

The following notes apply to these reports:

* LAB SAMPLE ID is the lab's primary identification for a sample.

* DEPARTMENT SAMPLE ID is an alternate lab id, for example one assigned by a radiochemistry department in a lab.

* CLIENT SAMPLE ID is the client's primary identification for a sample. It includes any sample preparation done by the client that is necessary to identify the sample.

* QC BATCH is a lab assigned code that groups samples to be processed and QCed together. These samples should have similar matrices.

  QC BATCH is not necessarily the same as SDG, which reflects samples received and reported together.

* All Lab Control Samples, Method Blanks, Duplicates and Matrix Spikes are shown that QC any of the samples. Due to possible reanalyses, not all results for all these QC samples may be relevant to the SDG. The Lab Control Sample, Method Blank, Duplicate, Matrix Spike and Method Summary Reports detail these relationships.

Lab id EBRLNE
Protocol Hanford
Version Ver 1.0
Form DVD-RG
Version 3.06
Report date 08/04/03

SDG 7538
Contact Melissa C. Mannion

REPORT GUIDE

Client Hanford
Contract No. 630
Case no SDG_H2264

PREPARATION BATCH SUMMARY

The Preparation Batch Summary Report shows all preparation batches in one Sample Delivery Group (SDG) with information necessary to check the completeness and consistency of the SDG.

The following notes apply to this report:

* The preparation batches are shown in the same order as the Method Summary Reports are printed.

* Only analyses of planchets relevant to the SDG are included.

* Each preparation batch should have at least one Method Blank and LCS in it to validate client sample results.

* The QUALIFIERS shown are all qualifiers other than U, J, B, L and H that occur on any analysis in the preparation batch. The Method Summary Report has these qualifiers on a per sample basis.

  These qualifiers should be reviewed as follows:

  X Some data has been manually entered or modified. Transcription errors are possible.

  P One or more results are 'preliminary'. The data is not ready for final reporting.

  2 There were two or more results for one analyte on one planchet imported at one time. The results in DVD may not be the same as on the raw data sheets.

  Other lab defined qualifiers may occur. In general, these should be addressed in the SDG narrative.

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EBERLINE SERVICES/RICHMOND

SAMPLE DELIVERY GROUP H2264

SDG 7538
Contact Melissa C. Mannion

REPORT GUIDE

Client Hanford
Contract No. 630
Case no SDG H2264

WORK SUMMARY

The Work Summary Report shows all samples, including QC samples, and all relevant analyses in one Sample Delivery Group (SDG). This report is often useful as supporting documentation for an invoice.

The following notes apply to this report:

* TEST is a code for the method used to measure associated analytes. Results and related information for each analyte are on the Data Sheet Report. In special cases, a test code used in the summary data section is not the same as in associated raw data. In this case, both codes are shown on the Work Summary.

* SUFFIX is the lab's code to distinguish multiple analyses (recounts, reworks, reanalyses) of a fraction of the sample. The suffix indicates which result is being reported. An empty suffix normally identifies the first attempt to analyze the sample.

* The LAB SAMPLE ID, TEST and SUFFIX uniquely identify all supporting data for a result. The Method Summary Report for each TEST has method performance data, such as yield, for each lab sample id and suffix and procedures used in the method.

* PLANCHET is an alternate lab identifier for work done for one test. It, combined with the TEST and SUFFIX, may be the best link to raw data.

* For QC samples, only analyses that directly QC some regular sample are shown. The Lab Control Sample, Method Blank, Duplicate, Matrix Spike and Method Summary Reports detail these relationships.

* The SAS (Special Analytical Services) Number is a client or lab assigned code that reflects special processing for samples, such as rapid turn around. Counts of tests done are lists by SAS number since it is likely to affect prices.

Lab id EBRLNE
Protocol Hanford
Version Ver 1.0
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Version 3.06
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SDG 7538
Contact Melissa C. Mannion

REPORT GUIDE

Client Hanford
Contract No. 630
Case no SDG H2264

DATA SHEET

The Data Sheet Report shows all results and primary supporting information for one client sample or Method Blank. This report corresponds to both the CLP Inorganics and Organics Data Sheet.

The following notes apply to this report:

* TEST is a code for the method used to measure an analyte. If the TEST is empty, no data is available; the analyte was not analyzed for.

* The LAB SAMPLE ID and TEST uniquely identify work within the Summary Data Section of a Data Package. The Work Summary and Method Summary Reports further identify raw data that underlies this work.

  The Method Summary Report for each TEST has method performance data, such as yield, for each Lab Sample ID and a list of procedures used in the method.

* ERRORs can be labeled TOTAL or COUNT. TOTAL implies a preparation (non-counting method) error has been added, as square root of sum of squares, to the counting error denoted by COUNT. The preparation errors, which may vary by preparation batch, are shown on the Method Summary Report.

* A RESULT can be 'N.R.' (Not Reported). This means the lab did this work but chooses not to report it now, possibly because it was reported at another time.

* When reporting a Method Blank, a RESULT can be 'N.A.' (Not Applicable). This means there is no reported client sample work in the same preparation batch as the Blank's result. This is likely to occur when the Method Blank is associated with reanalyses of selected work for a few samples in the SDG.

The following qualifiers are defined by the DVD system:

U The RESULT is less than the MDA (Minimum Detectable Activity).

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If the MDA is blank, the ERROR is used as the limit.

J The RESULT is less than the RDL (Required Detection Limit) and no U qualifier is assigned.

B A Method Blank associated with this sample had a result without a U flag and, after correcting for possibly different aliquots, that result is greater than or equal to the MDA for this sample.

Normally, B is not assigned if U is. When method blank subtraction is shown on this report, B flags are assigned based on the unsubtracted values while U's are assigned based on the subtracted ones. Both flags can be assigned in this case.

For each sample result, all Method Blank results in the same preparation batch are compared. The Method Summary Report documents this and other QC relationships.

L Some Lab Control Sample that QC's this sample had a low recovery. The lab can disable assignment of this qualifier.

H Similar to 'L' except the recovery was high.

P The RESULT is 'preliminary'.

X Some data necessary to compute the RESULT, ERROR or MDA was manually entered or modified.

2 There were two or more results available for this analyte. The reported result may not be the same as in the raw data.

Other qualifiers are lab defined. Definitions should be in the SDG narrative.

The following values are underlined to indicate possible problems:

* An MDA is underlined if it is bigger than its RDL.

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GUIDE, cont.

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DATA SHEET

* An ERROR is underlined if the 1.645 sigma counting error is bigger than both the MDA and the RESULT, implying that the MDA may not be a good estimate of the 'real' minimum detectable activity.

* A negative RESULT is underlined if it is less than the negative of its 2 sigma counting ERROR.

* When reporting a Method Blank, a RESULT is underlined if greater than its MDA. If the MDA is blank, the 2 sigma counting error is used in the comparison.

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REPORT GUIDE

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LAB CONTROL SAMPLE

The Lab Control Sample Report shows all results, recoveries and primary supporting information for one Lab Control Sample.

The following notes apply to this report:

* All fields in common with the Data Sheet Report have similar usage. Refer to its Report Guide for details.

* An amount ADDED is the lab's value for the actual amount spiked into this sample with its ERROR an estimate of the error of this amount.

  An amount added is underlined if its ratio to the corresponding RDL is outside protocol specified limits.

* REC (Recovery) is RESULT divided by ADDED expressed as a percent.

* The first, computed limits for the recovery reflect:

  1. The error of RESULT, including that introduced by rounding the result prior to printing.

     If the limits are labeled (TOTAL), they include preparation error in the result. If labeled (COUNT), they do not.

  2. The error of ADDED.

  3. A lab specified, per analyte bias. The bias changes the center of the computed limits.

* The second limits are protocol defined upper and lower QC limits for the recovery.

* The recovery is underlined if it is outside either of these ranges.

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DUPLICATE

The Duplicate Report shows all results, differences and primary supporting information for one Duplicate and associated Original sample.

The following notes apply to this report:

* All fields in common with the Data Sheet Report have similar usage. This applies both to the Duplicate and Original sample data. Refer to the Data Sheet Report Guide for details.

  If the Duplicate has data for a TEST and the lab did not do this test to the Original, the Original's RESULTs are underlined.

* The RPD (Relative Percent Difference) is the absolute value of the difference of the RESULTs divided by their average expressed as a percent.

  If both RESULTs are less than their MDAs, no RPD is computed and a '-' is printed.

  For an analyte, if the lab did work for both samples but has data for only one, the MDA from the sample with data is used as the other's result in the RPD.

* The first, computed limit is the sum, as square root of sum of squares, of the errors of the results divided by the average result as a percent, hence the relative error of the difference rather than the error of the relative difference. The errors include those introduced by rounding the RESULTs prior to printing.

  If this limit is labeled TOT, it includes the preparation error in the RESULTs. If labeled CNT, it does not.

  This value reported for this limit is at most 999.

* The second limit for the RPD is the larger of:

  1. A fixed percentage specified in the protocol.

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DUPLICATE

2. A protocol factor (typically 2) times the average MDA as a percent of the average result. This limit applies when the results are close to the MDAs.

* The RPD is underlined if it is greater than either limit.

* If specified by the lab, the second limit column is replaced by the Difference Error Ratio (DER), which is the absolute value of the difference of the results divided by the quadratic sum of their one sigma errors, the same errors as used in the first limit.

  Except for differences due to rounding, the DER is the same as the RPD divided by the first RPD limit with the limit scaled to 1 sigma.

* The DER is underlined if it is greater than the sigma factor, typically 2 or 3, shown in the header for the first RPD limit.

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MATRIX SPIKE

The Matrix Spike Report shows all results, recoveries and primary supporting information for one Matrix Spike and associated Original sample.

The following notes apply to this report:

* All fields in common with the Data Sheet Report have similar usage. This applies both to the Spiked and Original sample data. Refer to the Data Sheet Report Guide for details.

  If the Spike has data for a TEST and the lab did not do this test to the Original, the Original's RESULTs are underlined.

* An amount ADDED is the lab's value for the actual amount spiked into the Spike sample with its ERROR an estimate of the error of this amount.

  An amount is underlined if its ratio to the corresponding RDL is outside protocol specified limits.

* REC (Recovery) is the Spike RESULT minus the Original RESULT divided by ADDED expressed as a percent.

* The first, computed limits for the recovery reflect:

  1. The errors of the two RESULTs, including those introduced by rounding them prior to printing.

     If the limits are labeled (TOTAL), they include preparation error in the result. If labeled (COUNT), they do not.

  2. The error of ADDED.

  3. A lab specified, per analyte bias. The bias changes the center of the computed limits.

* The second limits are protocol defined upper and lower QC limits

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MATRIX SPIKE

for the recovery.

These limits are left blank if the Original RESULT is more than a protocol defined factor (typically 4) times ADDED. This is a way of accounting for that when the spike is small compared to the amount in the original sample, the recovery is unreliable.

* The recovery is underlined (out of spec) if it is outside either of these ranges.

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METHOD SUMMARY

The Method Summary Report has two tables. One shows up to five results measured using one method. The other has performance data for the method. There is one report for each TEST, as used on the Data Sheet Report.

The following notes apply to this report:

* Each table is subdivided into sections, one for each preparation batch. A preparation batch is a group of aliquots prepared at roughly the same time in one work area of the lab using the same method.

  There should be Lab Control Sample and Method Blank results in each preparation batch since this close correspondence makes the QC meaningful. Depending on lab policy, Duplicates need not occur in each batch since they QC sample dependencies such as matrix effects.

* The RAW TEST column shows the test code used in the raw data to identify a particular analysis if it is different than the test code in the header of the report. This occurs in special cases due to method specific details about how the lab labels work.

  The Lab Sample or Planchet ID combined with the (Raw) Test Code and Suffix uniquely identify the raw data for each analysis.

* If a result is less than both its MDA and RDL, it is replaced by just 'U' on this report. If it is greater than or equal to the RDL but less than the MDA, the result is shown with a 'U' flag.

  The J and X flags are as on the data sheet.

* Non-U results for Method Blanks are underlined to indicate possible contamination of other samples in the preparation batch. The Method Blank Report has supporting data.

* Lab Control Sample and Matrix Spike results are shown as: ok, No data, LOW or HIGH, with the last two underlined. 'No data'

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means no amount ADDED was specified. 'LOW' and 'HIGH' correspond to when the recovery is underlined on the Lab Control Sample or Matrix Spike Report. See these reports for supporting data.

* Duplicate sample results are shown as: ok, No data, or OUT, with the last two underlined. 'No data' means there was no original sample data found for this duplicate. 'OUT' corresponds to when the RPD is underlined on the Duplicate Report. See this report for supporting data.

* If the MDA column is labeled 'MAX MDA', there was more than one result measured by the reported method and the MDA shown is the largest MDA. If not all these results have the same RDL, the MAX MDA reflects only those results with RDL equal to the smallest one.

  MDAs are underlined if greater than the printed RDL.

* Aliquots are underlined if less than the nominal value specified for the method.

* Prepareation factors are underlined if greater than the nominal value specified for the method.

* Dilution factors are underlined if greater than the nominal value specified for the method.

* Residues are underlined if outside the range specified for the method. Residues are not printed if yields are.

* Yields, which may be gravimetric, radiometric or some type of recovery depending on the method, are underlined if outside the range specified for the method.

* Efficiencies are underlined if outside the range specified for the method. Efficiencies are detector and geometry dependent so this test is only approximate.

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METHOD SUMMARY

* Count times are underlined if less than the nominal value specified for the method.

* Resolutions (as FWHM; Full Width at Half Max) are underlined if greater than the method specified limit.

* Tracer drifts are underlined if their absolute values are greater than the method specified limit. Tracer drifts are not printed if percent moistures are.

* Days Held are underlined if greater than the holding time specified in the protocol.

* Analysis dates are underlined if before their planchet's preparation date or, if a limit is specified, too far after it.

For some methods, ratios as percentages and error estimates for them are computed for pairs of results. A ratio column header like '1÷3' means the ratio of the first result column and the third result column.

Ratios are not computed for Lab Control Sample, Method Blank or Matrix Spike results since their matrices are not necessarily similar to client samples'.

The error estimate for a ratio of results from one planchet reflects only counting errors since other errors should be correlated. For a ratio involving different planchets, if QC limits are computed based on total errors, the error for the ratio allows for the preparation errors for the planchets.

The ratio is underlined (out of spec) if the absolute value of its difference from the nominal value is greater than its error estimate. If no nominal value is specified, this test is not done.

For Gross Alpha or Gross Beta results, there may be a column showing the sum of other Alpha or Beta emitters. This sum includes all relevant

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GUIDE, cont.

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METHOD SUMMARY

results in the DVD database, whether reported or not. Results in the sum are weighted by a particles/decay value specified by the lab for each relevant analyte. Results less than their MDA are not included. No sums are computed for Lab Control, Method Blank or Matrix Spike samples since their various planchets may not be physically related.

If a ratio of total isotopic to Gross Alpha or Beta is shown, the error for the ratio reflects both the error in the Gross result and the sum, as square root of sum of squares, of the errors in the isotopic results.

For total elemental uranium or thorium results, there may be a column showing the total weight computed from associated isotopic results. Ignoring results less than their MDAs, this is a weighted sum of the isotopic results. The weights depend on the molecular weight and half-life of each isotope so as to convert activities (decays) to weight (atoms).

If a ratio of total computed to measured elemental uranium or thorium is shown, the error for the ratio reflects the errors in all the measurements.

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FH-Central Plateau Project	CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST	F03-006-189	Page 1 of 1
Collector 6-11-3 ~~Johnson~~/Pope/Pfister/Hughes	Company Contact LC Hulstrom; Telephone No. 373-3928	Project Coordinator TRENT, SJ	Price Code 8N; Data Turnaround 45 Days
Project Designation 200-PW-2/200-PW-4 OU - Borehole Soil Sampling	Sampling Location 216-B-12 (C3246); 197.5-200 H2264 (7538)	SAF No. F03-006	Air Quality ☐
Ice Chest No. ERC 99-~~00~~-022 RE 6-12-03	Field Logbook No. HNF-N-3361; COA 117504ES10	Method of Shipment Federal Express	
Shipped To EBERLINE SERVICES (Formerly TMA)	Offsite Property No. A050 292	Bill of Lading/Air Bill No. SEE 05PC	

POSSIBLE SAMPLE HAZARDS/REMARKS

RADIOACTIVE TIE TO: B171P5

Special Handling and/or Storage

None

Preservation	Cool 4C	Cool 4C	None	Cool 4C	Cool 4C	None	None	None	
Type of Container	aG	aG	aG	aG	aG	aG	aG	aG	
No. of Container(s)	1	1	1	1	1	1	1	1	
Volume	60mL	125mL	60mL	125mL	60mL	60mL	60mL	60mL	
SAMPLE ANALYSIS	See item (1) in Special Instructions.	See item (2) in Special Instructions.	See item (3) in Special Instructions.	See item (4) in Special Instructions.	NO2/NO3 - 353.2; Oil & Grease - 413.1; Chromium Hex - 7196	See item (5) in Special Instructions.	See item (6) in Special Instructions.	Tritium - H3	

(Columns 1–5 struck through by hand, initialed PP 6-11-3)

Sample No.	Matrix *	Sample Date	Sample Time									
B161C2	SOIL	6-11-3	0925						X	X	X	

CHAIN OF POSSESSION — Sign/Print Names

Relinquished By/Removed From	Date/Time	Received By/Stored In	Date/Time
R. PFISTER	6/11/3 1417	[signature]	6/11/03 1417
[signature]	6/11/03 1417	R. Fehlberg ERC	6-11-03 1417
K. Fehlberg	6-11-03 1417	113 3758	6-11-03 1417
113 3728	6-12-03 1200	K. Fehlberg	6-12-03 1200
K. Fehlberg ERC	6-12-03 1000	Fed Ex	
Fed Ex		[signature]	6-13-03 1000

SPECIAL INSTRUCTIONS

The lab is to achieve a detection limit of 50.0 pCi/g for C-14. ~~Report kerosene and diesel range compounds from WTPH-D analysis.~~ PP 6-11-3 FH acknowledges that holding times (less than 14 days) may not be met by the lab due to the radl characteristics.

~~(1) Alcohols, Glycols, & Ketones - 8015 {1-Butanol, Diethyl ether, Ethylene glycol, Methanol}~~
~~(2) Semi-VOA - 8270A (TCL); Semi-VOA - 8270A (Add-On) {2-Butoxyethanol, Tributyl phosphate}; TPH Diesel Range - WTPH-D; TPH Gasoline Range - WTPH-G~~
~~(3) ICP Metals - 6010A (Supertrace) {Arsenic, Barium, Cadmium, Chromium, Lead, Selenium, Silver}; ICP Metals - 6010A (Supertrace Add-On) {Antimony, Beryllium, Bismuth, Boron, Copper, Nickel}; Mercury - 7471 - (CV)~~
~~(4) IC Anions - 300.0 {Chloride, Fluoride, Nitrate, Nitrite, Phosphate, Sulfate}; Ammonia - 350.3; pH (Soil) - 9045; Total Cyanide - 9010~~
(5) Gamma Spectroscopy {Cesium-137, Cobalt-60, Europium-152, Europium-154, Europium-155}; Gamma Spec - Add-on {Cesium-134, Radium-226, Radium-228, Tin-126}; Total Uranium; Americium-241; Isotopic Plutonium; Isotopic Uranium} Carbon 14, Iodine-129, Nickel-63, Neptunium-237
(6) Tech-99, Strontium-89,90, Total Sr, Isotopic Thorium (Thorium 232);

Matrix *: S=Soil, SE=Sediment, SO=Solid, SI=Sludge, W=Water, O=Oil, A=Air, DS=Drum Solids, DL=Drum Liquids, T=Tissue, WI=Wipe, L=Liquid, V=Vegetation, X=Other

LABORATORY SECTION	Received By	Title	Date/Time
FINAL SAMPLE DISPOSITION	Disposal Method	Disposed By	Date/Time

BHI-EE-011 (03/01/2002)

EBERLINE SERVICES

ANALYTICAL SERVICES GROUP
Richmond, CA Laboratory

SAMPLE RECEIPT CHECKLIST

Client: FLR Date/Time received 1000 6-13-03

CoC No. F03-006-189

Container I.D. No. GRC-99-022 Requested TAT (Days) 45 P.O. Received Yes [ ] No [ ]

INSPECTION

1.	Custody seals on shipping container intact?	Yes [✓]	No [ ]	N/A [ ]
2.	Custody seals on shipping container dated & signed?	Yes [✓]	No [ ]	N/A [ ]
3.	Custody seals on sample containers intact?	Yes [✓]	No [ ]	N/A [ ]
4.	Custody seals on sample containers dated & signed?	Yes [✓]	No [ ]	N/A [ ]
5.	Packing material is:	Wet [ ]	Dry [✓]	
6.	Number of samples in shipping container: 1			
7.	Number of containers per sample: 3 (Or see CoC ____)			
8.	Paperwork agrees with samples?	Yes [✓]	No [ ]	
9.	Samples have: Tape [ ] Hazard labels [ ] Rad labels [ ] ~~Appropriate~~ sample labels [✓]			
10.	Samples are: In good condition [✓] Leaking [ ] Broken Container [ ] Missing [ ]			
11.	*Samples are: Preserved [ ] Not preserved [ ] ~~Preservative~~* ____			
12.	Describe any anomalies: ____			
13.	Was P.M. notified of any anomalies? Yes [ ] No [ ] Date ____			
14.	Received by [signature] Date: 6-13-03 Time: 1000			

Customer Sample No.	cpm	mR/hr	wipe	Customer Sample No.	cpm	mR/hr	wipe
B161C2	240						

Ion Chamber Ser. No. ____ Calibration date ____

Alpha Meter Ser. No. ____ Calibration date ____

Beta/Gamma Meter Ser. No. 106261 Calibration date 2-14-03

LIONVILLE LABORATORY INC.

28 July 2003

Mr. Steve Trent
Fluor Hanford Inc.
825 Jadwin Ave.
Richland, WA 99352

Subject: Contract No. 630
Analytical Data Package

Dear Mr. Trent:

Enclosed are the hard copy analytical reports for the batch number/fraction indicated (marked X) in the following table:

LvLI Batch #	0306L625
SDG #	H2264
SAF #	F03-006
Date Received	6-13-03
# Samples	1
Matrix	Soil
Volatiles	
Semivolatiles	X
Pest/PCB	
DRO/GRO/KRO	X
Herbicides	
GC Alcohol	X
Metals	X
Inorganics	X

The electronic data deliverable (EDD) will be emailed shortly. If you have any questions, please don't hesitate to contact me at (610) 280-3012.

Sincerely,
Lionville Laboratory Incorporated

Orlette S. Johnson
Project Manager

208 Welsh Pool Road • Exton, PA 19341-1313 • (610) 280-3000 • Fax (610) 280-3041

Lionville Laboratory, Inc.
BNA ANALYTICAL DATA PACKAGE FOR
TNUHANFORD F03-006 H2264

DATE RECEIVED: 06/13/03 LVL LOT # :0306L625

CLIENT ID	LVL #	MTX	PREP #	COLLECTION	EXTR/PREP	ANALYSIS
B161C2	001	S	03LE0733	06/11/03	06/17/03	06/30/03
B161C2	001 MS	S	03LE0733	06/11/03	06/17/03	06/30/03
B161C2	001 MSD	S	03LE0733	06/11/03	06/17/03	06/30/03
LAB QC:						
SBLKVU	MB1	S	03LE0733	N/A	06/17/03	06/27/03
SBLKVU	MB1 BS	S	03LE0733	N/A	06/17/03	06/27/03

LIONVILLE LABORATORY INC.

Client: TNU-HANFORD F03-006
LVL #: 0306L625
SDG/SAF # H2264/F03-006

W.O. #: 11343-606-001-9999-00
Date Received: 06-13-2003

SEMIVOLATILE

One (1) soil sample was collected on 06-11-2003.

The sample and its associated QC samples were extracted according to Lionville Laboratory OPs based on method 3550 on 06-17-2003 and analyzed according to criteria set forth in Lionville Laboratory OPs based on SW 846 Method 8270C for TCL Semivolatile target compounds on 06-27,30-2003.

The following is a summary of the QC results accompanying the sample results and a description of any problems encountered during their analyses:

1. All results presented in this report are derived from a sample that met LvLI's sample acceptance policy.
2. The sample was extracted and analyzed within required holding time.
3. Non-target compounds were detected in the sample.
4. All surrogate recoveries were within EPA QC limits.
5. All blank spike recoveries were within EPA QC limits.
6. All matrix spike recoveries were within EPA QC limits.
7. The method blank contained the common laboratory contaminants Bis (2-Ethylhexyl) phthalate and Di-n-butylphthalate at levels less than the CRQL.
8. Internal standard area and retention time criteria were met.
9. Manual integrations are performed according to OP 21-06A-125 to produce quality data with the utmost integrity. All manual integrations are required to be technically valid and properly documented. Appropriate technical flags are defined in the Glossary ("Technical Flags For Manual Integration").
10. I certify that this sample data package is in compliance with SOW requirements, both technically and for completeness, other than the conditions detailed above. Release of the data contained in this hard-copy data package has been authorized by the Laboratory Manager or a designee, as verified by the following signature.

J. Michael Taylor
President
Lionville Laboratory Incorporated

07-11-03
Date

som\gorup\data\bna\tnu-hanford-0306-625.doc

208 Welsh Pool Road • Exton, PA 19341-1313 • (610) 280-3000 • Fax (610) 280-3041

GLOSSARY

DATA QUALIFIERS

U	=	Compound was analyzed for but not detected. The associated numerical value is the estimated sample quantitation limit which is included and corrected for dilution and percent moisture.
J	=	Indicates an estimated value. This flag is used under the following circumstances: 1) when estimating a concentration for tentatively identified compounds (TICs) where a 1:1 response is assumed; or 2) when the mass spectral data indicate the presence of a compound that meets the identification criteria but the result is less than the specified detection limit but greater than zero. For example, if the limit of detection is 10 ug/L and a concentration of 3 ug/L is calculated, it is reported as 3J.
B	=	This flag is used when the analyte is found in the associated blank as well as in the sample. It indicates possible/probable blank contamination. This flag is also used for a TIC as well as for a positively identified TCL compound.
E	=	Indicates that the compound was detected beyond the calibration range and was subsequently analyzed at a dilution.
D	=	Identifies all compounds identified in an analysis at a secondary dilution factor.
I	=	Interference.
NQ	=	Result qualitatively confirmed but not able to quantify.
A	=	Indicates that a TIC is a suspected aldol-condensation product.
N	=	Indicates presumptive evidence of a compound. This flag is only used for tentatively identified compounds (TICs), where the identification is based on a mass spectral library search. It is applied to all TIC results. For generic characterization of a TIC, such as chlorinated hydrocarbon, the N code is not used.
X	=	This flag is used for a TIC compound which is quantified relative to a response factor generated from a daily calibration standard (rather than quantified relative to the closest internal standard).
Y	=	Additional qualifiers used as required are explained in the case narrative.

GLOSSARY

ABBREVIATIONS

BS = Indicates blank spike in which reagent grade water is spiked with the CLP matrix spike solutions and carried through all the steps in the method. Spike recoveries are reported.

BSD = Indicates blank spike duplicate.

MS = Indicates matrix spike.

MSD = Indicates matrix spike duplicate.

DL = Suffix added to sample number to indicate that results are from a diluted analysis.

NA = Not Applicable.

DF = Dilution Factor.

NR = Not Required.

SP, Z = Indicates Spiked Compound.

TECHNICAL FLAGS FOR MANUAL INTEGRATION

Manual quan modifications or integrations are performed routinely to improve the data quality for a variety of technical reasons. Documentation of these modifications should be clear and concise. The following "flags" are used to indicate the technical reasons for quan modifications:

MP - Missed Peak: manually added peak not found by automatic quan program.

PA - Peak Assignment: quan report was changed to reflect correct peak assignment.

RI - Routine Integration: routine integrations are performed for some analytes that are consistently integrated improperly by the automatic integration programs. Examples are the dichlorobenzene isomers on the VOA packed column and benzo(b)fluoranthene/benzo(k)fluoranthene which are poorly resolved on the BNA column.

SP - Split Peak: the automatic integration improperly split the peak; a manual integration was performed to get the correct area.

CB - Coelution/Background: peak was manually integrated to eliminate contribution from coeluting compounds, background signal, or other interference.

PI - Proper Integration: a peak with poor or inconsistent integration (e.g., excessive tail) was properly integrated manually.

Lionville Laboratory, Inc.

Semivolatiles by GC/MS, Special List — Report Date: 07/08/03 10:26

RFW Batch Number: **0306L625** Client: **TNUHANFORD F03-006 H2264** Work Order: 11343606001 Page: 1a

	Cust ID:	B161C2	B161C2	B161C2	SBLKVU	SBLKVU BS
Sample Information	RFW#:	001	001 MS	001 MSD	03LE0733-MB1	03LE0733-MB1
	Matrix:	SOIL	SOIL	SOIL	SOIL	SOIL
	D.F.:	1.00	1.00	1.00	1.00	1.00
	Units:	UG/KG	UG/KG	UG/KG	UG/KG	UG/KG
Surrogate Recovery	Nitrobenzene-d5	57 %	67 %	67 %	68 %	63 %
	2-Fluorobiphenyl	55 %	69 %	71 %	70 %	68 %
	Terphenyl-d14	77 %	83 %	84 %	91 %	85 %
	Phenol-d5	54 %	63 %	64 %	64 %	61 %
	2-Fluorophenol	53 %	63 %	63 %	62 %	58 %
	2,4,6-Tribromophenol	55 %	69 %	68 %	71 %	72 %
Phenol		340 U	64 %	64 %	330 U	63 %
bis(2-Chloroethyl)ether		340 U	340 U	340 U	330 U	330 U
2-Chlorophenol		340 U	60 %	61 %	330 U	60 %
1,3-Dichlorobenzene		340 U	340 U	340 U	330 U	330 U
1,4-Dichlorobenzene		340 U	60 %	60 %	330 U	60 %
1,2-Dichlorobenzene		340 U	340 U	340 U	330 U	330 U
2-Methylphenol		340 U	340 U	340 U	330 U	330 U
2,2'-oxybis(1-Chloropropane)		340 U	340 U	340 U	330 U	330 U
3- and/or 4-Methylphenol		340 U	340 U	340 U	330 U	330 U
N-Nitroso-di-n-propylamine		340 U	65 %	66 %	330 U	64 %
Hexachloroethane		340 U	340 U	340 U	330 U	330 U
Nitrobenzene		340 U	340 U	340 U	330 U	330 U
Isophorone		340 U	340 U	340 U	330 U	330 U
2-Nitrophenol		340 U	340 U	340 U	330 U	330 U
2,4-Dimethylphenol		340 U	340 U	340 U	330 U	330 U
bis(2-Chloroethoxy)methane		340 U	340 U	340 U	330 U	330 U
2,4-Dichlorophenol		340 U	340 U	340 U	330 U	330 U
1,2,4-Trichlorobenzene		340 U	58 %	59 %	330 U	60 %
Naphthalene		340 U	340 U	340 U	330 U	330 U
4-Chloroaniline		340 U	340 U	340 U	330 U	330 U
Hexachlorobutadiene		340 U	340 U	340 U	330 U	330 U
4-Chloro-3-methylphenol		340 U	65 %	67 %	330 U	68 %
2-Methylnaphthalene		340 U	340 U	340 U	330 U	330 U
Hexachlorocyclopentadiene		340 U	340 U	340 U	330 U	330 U
2,4,6-Trichlorophenol		340 U	340 U	340 U	330 U	330 U
2,4,5-Trichlorophenol		850 U	850 U	850 U	840 U	840 U

*= Outside of EPA CLP QC limits.

	Cust ID:	B161C2		B161C2		B161C2		SBLKVU		SBLKVU BS	
	RFW#:	001		001 MS		001 MSD		03LE0733-MB1		03LE0733-MB1	
2-Chloronaphthalene		340	U	340	U	340	U	330	U	330	U
2-Nitroaniline		850	U	850	U	850	U	840	U	840	U
Dimethylphthalate		340	U	340	U	340	U	330	U	330	U
Acenaphthylene		340	U	340	U	340	U	330	U	330	U
2,6-Dinitrotoluene		340	U	340	U	340	U	330	U	330	U
3-Nitroaniline		850	U	850	U	850	U	840	U	840	U
Acenaphthene		340	U	68	%	69	%	330	U	69	%
2,4-Dinitrophenol		850	U	850	U	850	U	840	U	840	U
4-Nitrophenol		850	U	77	%	77	%	840	U	81	%
Dibenzofuran		340	U	340	U	340	U	330	U	330	U
2,4-Dinitrotoluene		340	U	75	%	74	%	330	U	78	%
Diethylphthalate		340	U	340	U	340	U	330	U	330	U
4-Chlorophenyl-phenylether		340	U	340	U	340	U	330	U	330	U
Fluorene		340	U	340	U	340	U	330	U	330	U
4-Nitroaniline		850	U	850	U	850	U	840	U	840	U
4,6-Dinitro-2-methylphenol		850	U	850	U	850	U	840	U	840	U
N-Nitrosodiphenylamine (1)		340	U	340	U	340	U	330	U	330	U
4-Bromophenyl-phenylether		340	U	340	U	340	U	330	U	330	U
Hexachlorobenzene		340	U	340	U	340	U	330	U	330	U
Pentachlorophenol		850	U	70	%	69	%	840	U	77	%
Phenanthrene		340	U	340	U	340	U	330	U	330	U
Anthracene		340	U	340	U	340	U	330	U	330	U
Carbazole		340	U	340	U	340	U	330	U	330	U
Di-n-butylphthalate		28	JB	34	JB	31	JB	18	J	21	JB
Fluoranthene		340	U	340	U	340	U	330	U	330	U
Pyrene		340	U	72	%	73	%	330	U	76	%
Butylbenzylphthalate		340	U	340	U	340	U	330	U	330	U
3,3'-Dichlorobenzidine		340	U	340	U	340	U	330	U	330	U
Benzo(a)anthracene		340	U	340	U	340	U	330	U	330	U
Chrysene		340	U	340	U	340	U	330	U	330	U
bis(2-Ethylhexyl)phthalate		340	U	340	U	64	JB	21	J	330	U
Di-n-octyl phthalate		340	U	340	U	340	U	330	U	330	U
Benzo(b)fluoranthene		340	U	340	U	340	U	330	U	330	U
Benzo(k)fluoranthene		340	U	340	U	340	U	330	U	330	U
Benzo(a)pyrene		340	U	340	U	340	U	330	U	330	U
Indeno(1,2,3-cd)pyrene		340	U	340	U	340	U	330	U	330	U
Dibenz(a,h)anthracene		340	U	340	U	340	U	330	U	330	U
Benzo(g,h,i)perylene		340	U	340	U	340	U	330	U	330	U
2-Butoxyethanol		340	U	340	U	340	U	330	U	330	U
Benzyl alcohol		340	U	340	U	340	U	330	U	330	U

*= Outside of EPA CLP QC limits.

Cust ID:	B161C2	B161C2	B161C2	SBLKVU	SBLKVU BS
RFW#:	001	001 MS	001 MSD	03LE0733-MB1	03LE0733-MB1
Tributylphosphate	340 U	340 U	340 U	330 U	330 U

(1) - Cannot be separated from Diphenylamine. *= Outside of EPA CLP QC limits.

1F

SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

CLIENT SAMPLE NO.

B161C2

Lab Name: Lionville Labs, Inc. Work Order: 11343606001

Client: TNUHANFORD F03-006 H2264

Matrix: (soil/water) SOIL

Lab Sample ID: 0306L625-001

Sample wt/vol: 30.0 (g/mL) G

Lab File ID: D063010

Level: (low/med) LOW

Date Received: 06/13/03

% Moisture: 2 decanted: (Y/N)

Date Extracted: 06/17/03

Concentrated Extract Volume: 1000 (uL)

Date Analyzed: 06/30/03

Injection Volume: 2.0 (uL)

Dilution Factor: 1.00

GPC Cleanup: (Y/N) N

pH: 7.0

Number TICs found: 4

CONCENTRATION UNITS:
(ug/L or ug/Kg) UG/KG

	CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q
1.		UNKNOWN	4.416	100	JB
2.		ALDOL CONDENSATE	4.791	100	JAB
3.		ALDOL CONDENSATE	5.324	10000	JAB
4.	79-34-5	1,1,2,2-TETRACHLOROETHANE	6.651	100	JBN

1F

SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

CLIENT SAMPLE NO.

SBLKVU

Lab Name: Lionville Labs, Inc. Work Order: 11343606001

Client: TNUHANFORD F03-006 H2264

Matrix: (soil/water) SOIL

Lab Sample ID: 03LE0733-MB1

Sample wt/vol: 30.0 (g/mL) G

Lab File ID: D062711

Level: (low/med) LOW

Date Received: 06/17/03

% Moisture: _____ decanted: (Y/N)__

Date Extracted: 06/17/03

Concentrated Extract Volume: 1000(uL)

Date Analyzed: 06/27/03

Injection Volume: 2.0(uL)

Dilution Factor: 1.00

GPC Cleanup: (Y/N) N

pH: 7.0

Number TICs found: 5

CONCENTRATION UNITS:
(ug/L or ug/Kg) UG/KG

	CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q
1.	79-00-5	1,1,2-TRICHLOROETHANE	3.961	70	JN
2.		UNKNOWN	4.433	200	J
3.		ALDOL CONDENSATE	4.808	100	JA
4.		ALDOL CONDENSATE	5.341	10000	JA
5.	79-34-5	1,1,2,2-TETRACHLOROETHANE	6.668	100	JN

Lionville Laboratory Use Only
0306L625

Custody Transfer Record/Lab Work Request

Page 1 of 1

LVLI — LIONVILLE LABORATORY INC.

FIELD PERSONNEL: COMPLETE ONLY SHADED AREAS

Client: TNU-HANFORD F03-006

Est. Final Proj. Sampling Date: ____

Project #: 11343-606-001-9999-00

Project Contact/Phone #: ____

Lionville Laboratory Project Manager: OJ

QC: SPEC Del: STD TAT: 30 days

Date Rec'd: 6-13-03 Date Due: 7-12-03

			VOA	BNA (A)	Pest/PCB	Herb	Alcohols/glycols/ketones (B)			ICP Metal (C)	CN	I.C. Anions (D)	NO2 NO3 OrgC Cr6 (E)				
Refrigerator #				2	1							1	2				
#/Type Container	Liquid																
	Solid			1AG			1AG			1AG		1AG	1AG				
Volume	Liquid																
	Solid			125			60			60		125	60				
Preservatives																	
Analyses requested (Organic / Inorg)			VOA	BNA	Pest/PCB	Herb	Alcohols/glycols/ketones			ICP Metal	CN	I.C. Anions	NO2 NO3 OrgC Cr6				

MATRIX CODES:
S - Soil
SE - Sediment
SO - Solid
SL - Sludge
W - Water
O - Oil
A - Air
DS - Drum Solids
DL - Drum Liquids
L - EP/TCLP Leachate
WI - Wipe
X - Other
F - Fish

Lab ID	Client ID/Description	Matrix QC Chosen (✓) MS	MSD	Matrix	Date Collected	Time Collected		0625X 0PRO 0GRO			0GCSC			MET①		INORG①	INH3N2 I0GGR ICR6				
001	B161C2	✓	✓	S	6-11-03	0925		1			1			1		1	1				

Lionville Laboratory Use Only

Special Instructions: SAF # F03-006

MET①: RCRA + Sb, Be, Bi, B, Cu, Ni

INORG①: IC: Cl, F, NO3, NO2, PO4, SO4
INH3N, IPH, ICNO

DATE/REVISIONS:
1. ____
2. ____
3. ____
4. ____
5. ____
6. ____

Relinquished by	Received by	Date	Time	Relinquished by	Received by	Date	Time
FEDEX	[signature]	6-13-03	0910				

COMPOSITE WASTE

ORIGINAL REWRITTEN

Discrepancies Between Samples Labels and COC Record? Y or (N)
NOTES:

Lionville Laboratory Use Only

Samples were:
1) Shipped ✓ or Hand Delivered ____
Airbill # SEE BELOW
2) Ambient or (Chilled)
3) Received in Good Condition (Y) or N
4) Samples Properly Preserved (Y) or N
5) Received Within Holding Times (Y) or N

Tamper Resistant Seal was:
1) Present on Outer Package (Y) or N
2) Unbroken on Outer Package (Y) or N
3) Present on Sample (Y) or N
4) Unbroken on Sample (Y) or N
COC Record Present Upon Sample Rec't (Y) or N
Cooler Temp. 1.5° °C

FH-Central Plateau Project	CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST		F03-006-189	Page 1 of 1
Collector 6-11-3 Johansen/Pope/Pfister/Hughes	Company Contact LC Hulstrom	Telephone No. 373-3928	Project Coordinator TRENT, SJ	Price Code 8N / Air Quality ☐	Data Turnaround 45 Days
Project Designation 200-PW-2/200-PW-4 OU - Borehole Soil Sampling	Sampling Location 216-B-12 (C3246); 197.5-200		SAF No. F03-006	
Ice Chest No. ERC 01-037	Field Logbook No. HNF-N-3361	COA 117504ES10	Method of Shipment Federal Express	
Shipped To ~~TMA~~ 6-9-03 EBERLINE SERVICES (Formerly TMA) Perra	Offsite Property No. A030286		Bill of Lading/Air Bill No. SEE OSPC	

POSSIBLE SAMPLE HAZARDS/REMARKS

RADIOACTIVE TIE TO: B171P5

Special Handling and/or Storage

Cool 4C

Preservation	Cool 4C	Cool 4C	None	Cool 4C	Cool 4C	None	None	None		
Type of Container	aG	aG	aG	aG	aG	aG	aG	aG		
No. of Container(s)	1	1	1	1	1	1	1	1		
Volume	60mL	125mL	60mL	125mL	60mL	60mL	60mL	60mL		
SAMPLE ANALYSIS	See item (1) in Special Instructions.	See item (2) in Special Instructions.	See item (3) in Special Instructions.	See item (4) in Special Instructions.	NO2/NO3 - 353.2; Oil & Grease - 413.1; Chromium Hex - 7196	See item (5) in Special Instructions.	See item (6) in Special Instructions.	Tritium - H3		
Sample No.	Matrix *	Sample Date	Sample Time							
B161C2	SOIL	6-11-3	0925	X	X	X	X	X		

CHAIN OF POSSESSION

Relinquished By/Removed From	Date/Time	Received By/Stored In	Date/Time
R. Pfister/[illegible]	6/11/3 1417	[illegible]	6/11/03 1417
[illegible]	6/11/03 1417	R. Fahlberg	6.11.03 1412
R. Fahlberg	6.11.03 1417	IB 3228	6.11.03 1417
IB 3228	6.12.03 1200	R. Fahlberg	6.12.03 1200
R. Fahlberg	6.12.03 1200	Fed Ex	
Fed Ex	6-13-03 0910	[illegible]	6-13-03 0910

SPECIAL INSTRUCTIONS

~~The lab is to achieve a detection limit of 50.0 pCi/g for C-14~~. Report kerosene and diesel range compounds from WTPH-D analysis. FH acknowledges that holding times (less than 14 days) may not be met by the lab due to the radl characteristics. 6-11-3

(1) Alcohols, Glycols, & Ketones - 8015 {1-Butanol, Diethyl ether, Ethylene glycol, Methanol}
(2) Semi-VOA - 8270A (TCL); Semi-VOA – 8270A (Add-On) {2-Butoxyethanol, Tributyl phosphate}; TPH-Diesel Range - WTPH-D; TPH-Gasoline Range - WTPH-G
(3) ICP Metals - 6010A (Supertrace) {Arsenic, Barium, Cadmium, Chromium, Lead, Selenium, Silver}; ICP Metals - 6010A (Supertrace Add-On) {Antimony, Beryllium, Bismuth, Boron, Copper, Nickel}; Mercury - 7471 - (CV)
(4) IC Anions - 300.0 {Chloride, Fluoride, Nitrate, Nitrite, Phosphate, Sulfate}; Ammonia - 350.3; pH (Soil) - 9045; Total Cyanide - 9010
(5) ~~Gamma Spectroscopy {Cesium-137, Cobalt-60, Europium-152, Europium-154, Europium-155}; Gamma Spec - Add-on {Cesium-134, Radium-226, Radium-228, Thr-126}; Total Uranium; Americium-241, Isotopic Plutonium, Isotopic Uranium~~ [illegible]
(6) ~~Tech-99, Strontium-89,90, Total Sr~~ [illegible]

Matrix *
S=Soil
SE=Sediment
SO=Solid
SI=Sludge
W = Water
O=Oil
A=Air
DS=Drum Solids
DL=Drum Liquids
T=Tissue
WI=Wipe
L=Liquid
V=Vegetation
X=Other

LABORATORY SECTION	Received By	Title	Date/Time
FINAL SAMPLE DISPOSITION	Disposal Method	Disposed By	Date/Time

BHI-EE-011 (03/01/2002)

LIONVILLE LABORATORY INCORPORATED
SAMPLE RECEIPT CHECKLIST

ENT: TNU-HANFORD

hase Order/Project:

DATE: 6-13-03

#/SOW#/Release #: F03-006

oratory SDG #: 0306L625

TE: ALL ENTRIES MARKED "NO" MUST BE EXPLAINED IN THE COMMENT SECTION

1.	Custody seals on coolers or shipping container intact, signed and dated?	☑ Yes	☐ No	☐ N/A	☐ see Comment #
2.	Outside of coolers or shipping containers are free from damage?	☑ Yes	☐ No	☐ N/A	☐ see Comment #
3.	Airbill # recorded?	☑ Yes	☐ No	☐ N/A	☐ see Comment #
4.	All expected paperwork received (coc and other client specific: historical data, alpha/beta or other screening data as applicable)? (paperwork sealed in plastic bag and taped to inside lid)	☑ Yes	☐ No	☐ N/A	☐ see Comment #
5.	Sample containers are intact?	☑ Yes	☐ No	☐ N/A	☐ see Comment #
6.	Custody seals on sample containers intact, signed and dated?	☑ Yes	☐ No	☐ N/A	☐ see Comment #
7.	All samples on coc received?	☑ Yes	☐ No	☐ N/A	☐ see Comment #
8.	All sample label information matches coc?	☑ Yes	☐ No	☐ N/A	☐ see Comment #
9.	Laboratory QC samples designated on coc? (QC stickers placed on bottles?)	☑ Yes	☐ No	☐ N/A	☐ see Comment #
10.	Shipment meets LvL1 Sample Acceptance Policy? (identify all bottles not within policy. See reverse side for policy)	☑ Yes	☐ No	☐ N/A	☐ see Comment #
11.	Where applicable, bar code labels are affixed to coc?	☐ Yes	☐ No	☑ N/A	☐ see Comment #
12.	coc signed and dated?	☑ Yes	☐ No	☐ N/A	☐ see Comment #
13.	coc will be faxed or emailed to client?	☑ Yes	☐ No	☐ N/A	☐ see Comment #
14.	Project Manager/Client contacted concerning discrepancies? (name/date)	☐ Yes	☐ No	☑ N/A	☐ see Comment #

Cooler # / temp (°C) and Comments:

ERC 01-037 1.5

Laboratory Sample Custodian: Carl Hung

Laboratory Project Manager:

Lionville Laboratory, Inc.
DRO ANALYTICAL DATA PACKAGE FOR
TNUHANFORD F03-006 H2264

DATE RECEIVED: 06/13/03 LVL LOT # :0306L625

CLIENT ID	LVL #	MTX	PREP #	COLLECTION	EXTR/PREP	ANALYSIS
B161C2	001	S	03LE0732	06/11/03	06/17/03	07/11/03
B161C2	001 MS	S	03LE0732	06/11/03	06/17/03	07/11/03
B161C2	001 MSD	S	03LE0732	06/11/03	06/17/03	07/11/03
LAB QC:						
BLK	MB1	S	03LE0732	N/A	06/17/03	07/08/03
BLK	MB1 BS	S	03LE0732	N/A	06/17/03	07/08/03

LIONVILLE LABORATORY INC.

Analytical Report

Client: TNU-HANFORD F03-006
LVL #: 0306L625
SDG/SAF #: H2264/F03-006

W.O. #: 11343-606-001-9999-00
Date Received: 06-13-03

DIESEL RANGE ORGANICS

One (1) soil sample was collected on 06-11-03.

The sample and its associated QC samples were extracted on 06-17-03 and analyzed according to Lionville Laboratory OPs based on SW846, 3rd Edition procedures on 07-08,11-03. The extraction procedure was based on method 3540 and the extracts were analyzed based on method 8015B. The analysis met the intent of method WTPH-D.

The following is a summary of the QC results accompanying the sample results and a description of any problems encountered during their analyses:

1. All results presented in this report are derived from samples that met LvLI's sample acceptance policy.
2. All required holding times for extraction and analysis have been met.
3. The method blank was below the reporting limits for all target compounds.
4. All surrogate recoveries were within acceptance criteria.
5. The blank spike recovery was within acceptance criteria.
6. All matrix spike recoveries were within acceptance criteria.
7. All initial calibrations associated with this data set were within acceptance criteria.
8. All continuing calibration standards analyzed prior to sample extracts were within acceptance criteria.
9. I certify that this sample data package is in compliance with SOW requirements, both technically and for completeness, other than the conditions detailed above. Release of the data contained in this hard-copy data package has been authorized by the laboratory Manager or a designee, as verified by the following signature.

Iain Daniels
Laboratory Manager
Lionville Laboratory Incorporated

7/16/03
Date

pef\r:\group\data\dro\tnu hanford\06L-625.doc

GLOSSARY OF DIESEL RANGE ORGANICS DATA

DATA QUALIFIERS

U = Indicates that the compound was analyzed for but not detected. The minimum detection limit for the sample (not the method detection limit) is reported with the U (e.g., 10U).

J = Indicates an estimated value. This flag is used in cases where a target analyte is detected at a level less than the lower quantification level. If the limit of quantification is 10 ug/L and a concentration of 3 ug/L is calculated, it is reported as 3J.

B = This flag is used when the analyte is found in the associated blank as well as in the sample. It indicates possible/probable blank contamination.

E = Indicates that the compound was detected beyond the calibration range and was subsequently analyzed at a dilution.

I = Interference.

ABBREVIATIONS

BS = Indicates blank spike in which reagent grade water is spiked with the CLP matrix spiking solutions and carried through all the steps in the method. Spike recoveries are reported.

BSD = Indicates blank spike duplicate.

MS = Indicates matrix spike.

MSD = Indicates matrix spike duplicate.

DL = Indicates that recoveries were not obtained because the extract had to be diluted for analysis.

NA = Not Applicable.

DF = Dilution Factor.

NR = Not Required.

SP = Indicates Spiked Compound.

GLOSSARY OF DIESEL RANGE ORGANICS DATA

D = This flag identifies all compounds identified in an analysis at a secondary dilution factor.

C = This flag applies to a compound that has been confirmed by GC/MS.

Lionville Laboratory, Inc.

DIESEL RANGE ORGANICS BY GC

Report Date: 07/11/03 15:06

RFW Batch Number: **0306L625** Client: **TNUHANFORD F03-006 H2264** Work Order: 11343606001 Page: 1

	Cust ID:	B161C2	B161C2	B161C2	BLK	BLK BS
Sample Information	RFW#:	001	001 MS	001 MSD	03LE0732-MB1	03LE0732-MB1
	Matrix:	SOIL	SOIL	SOIL	SOIL	SOIL
	D.F.:	1.00	1.00	1.00	1.00	1.00
	Units:	mg/Kg	mg/Kg	mg/Kg	mg/Kg	mg/Kg
p-Terphenyl		77 %	68 %	65 %	77 %	78 %
Diesel Range Organics		12.3 U	78 %	76 %	12.0 U	75 %
Kerosene		12.3 U	12.3 U	12.3 U	12.0 U	12.0 U

U= Analyzed, not detected. J= Present below detection limit. B= Present in blank. NR= Not reported. NS= Not spiked.
%= Percent recovery. D= Diluted out. I= Interference. NA= Not Applicable. *= Outside of EPA CLP QC

Lionville Laboratory Use Only
0306L625

Custody Transfer Record/Lab Work Request

Page 1 of 1

LVLI LIONVILLE LABORATORY INC.

FIELD PERSONNEL: COMPLETE ONLY SHADED AREAS

Client TNU-HANFORD F03-006

Est. Final Proj. Sampling Date

Project # 11343-606-001-9999-00

Project Contact/Phone #

Lionville Laboratory Project Manager OJ

QC SPEC Del STD TAT 30 days

Date Rec'd 6-13-03 Date Due 7-17-03

			A			B			C		D	E
Refrigerator #			2								1	2
#/Type Container	Liquid											
	Solid		1AG			1AG			1AG		1AG	1AG
Volume	Liquid											
	Solid		125			60			60		125	60
Preservatives												
ANALYSES REQUESTED →	ORGANIC: VOA		BNA	Pest/PCB	Herb	Alcohols Glycols Ketones			INORG: ICP Metal	CN	IC Anions	NO2 NO3 Other

MATRIX CODES:
S - Soil
SE - Sediment
SO - Solid
SL - Sludge
W - Water
O - Oil
A - Air
DS - Drum Solids
DL - Drum Liquids
L - EP/TCLP Leachate
WI - Wipe
X - Other
F - Fish

Lionville Laboratory Use Only: 0625X OPRO OGRO | OGCSC | MET0 | INORG1 | INH3N2 IOGGR ICR6

Lab ID	Client ID/Description	MS	MSD	Matrix	Date Collected	Time Collected	0625X OPRO OGRO	OGCSC	MET0	INORG1	INH3N2 IOGGR ICR6
001	B161C2	✓	✓	S	6-11-03	0925	1	1	1	1	1

Special Instructions: SAF # F03-006

MET 0: RCRA + Sb, Be, Bi, B, Cu, Ni

INORG 1: IC: Cl, F, NO3, NO2, PO4, SO4
INH3N, IPH, ICNTO

DATE/REVISIONS:
1.
2.
3.
4.
5.
6.

Lionville Laboratory Use Only

Samples were:
1) Shipped ✓ or Hand Delivered
Airbill # SEE BELOW
2) Ambient or (Chilled)
3) Received in Good Condition (Y) or N
4) Samples Properly Preserved (Y) or N
5) Received Within Holding Times (Y) or N

Tamper Resistant Seal was:
1) Present on Outer Package (Y) or N
2) Unbroken on Outer Package (Y) or N
3) Present on Sample (Y) or N
4) Unbroken on Sample (Y) or N
COC Record Present Upon Sample Rec't (Y) or N
Cooler Temp. 1.5 °C

Relinquished by	Received by	Date	Time	Relinquished by	Received by	Date	Time
FEDEX	[signature]	6-13-03	0910	COMPOSITE WASTE	ORIGINAL REWRITTEN		

Discrepancies Between Samples Labels and COC Record? Y or (N)
NOTES:
7929 0769 7042

FH-Central Plateau Project	CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST	F03-006-189	Page 1 of 1

Collector 6-11-3 ~~Johansen~~/Pope/Pfister/Hughes
Company Contact LC Hulstrom — **Telephone No.** 373-3928
Project Coordinator TRENT, SJ
Price Code 8N — **Data Turnaround** 45 Days
Project Designation 200-PW-2/200-PW-4 OU - Borehole Soil Sampling
Sampling Location 216-B-12 (C3246); 197.5-200
SAF No. F03-006
Air Quality ☐
Ice Chest No. ERC 01-037
Field Logbook No. HNF-N-3361
COA 117504ES10
Method of Shipment Federal Express
Shipped To ~~EBERLINE SERVICES (Formerly TMA)~~ Recra 6-9-03
Offsite Property No. A030286
Bill of Lading/Air Bill No. SEE OSPC

POSSIBLE SAMPLE HAZARDS/REMARKS
RADIOACTIVE TIE TO: B171P5

Special Handling and/or Storage
Cool 4C

			Preservation	Cool 4C	Cool 4C	None	Cool 4C	Cool 4C	None	None	None	
			Type of Container	aG	aG	aG	aG	aG	aG	aG	aG	
			No. of Container(s)	1	1	1	1	1	1	1	1	
			Volume	60mL	125mL	60mL	125mL	60mL	60mL	60mL	60mL	
SAMPLE ANALYSIS				See item (1) in Special Instructions.	See item (2) in Special Instructions.	See item (3) in Special Instructions.	See item (4) in Special Instructions.	NO2/NO3 - 353.2; Oil & Grease - 413.1; Chromium Hex - 7196	See item (5) in Special Instructions.	See item (6) in Special Instructions.	Tritium - H3	
Sample No.	Matrix *	Sample Date	Sample Time									
B161C2	SOIL	6-11-3	0925	X	X	X	X	X				

CHAIN OF POSSESSION — Sign/Print Names

Relinquished By/Removed From	Date/Time	Received By/Stored In	Date/Time
R. PFISTER	6/11/3 1417	[signature]	6/11/03 1417
[signature]	6/11/03 1417	R. Fahlberg	6-11-03 1417
R. Fahlberg	6-11-03 1417	1B 3728	6-11-03 1417
1B 3728	6-12-03 1200	R. Fahlberg	6-12-03 1200
R. Fahlberg ERC	6-12-03 1200	Fed Ex	
FedEx	6-13-03 0910	[signature]	6-13-03 0910

SPECIAL INSTRUCTIONS 6-11-3
~~The lab is to achieve a detection limit of 50.0 pCi/g for C-14~~. Report kerosene and diesel range compounds from WTPH-D analysis. FH acknowledges that holding times (less than 14 days) may not be met by the lab due to the radl characteristics.

(1) Alcohols, Glycols, & Ketones - 8015 {1-Butanol, Diethyl ether, Ethylene glycol, Methanol}
(2) Semi-VOA - 8270A (TCL); Semi-VOA -- 8270A (Add-On) {2-Butoxyethanol, Tributyl phosphate}; TPH-Diesel Range - WTPH-D; TPH-Gasoline Range - WTPH-G
(3) ICP Metals - 6010A (Supertrace) {Arsenic, Barium, Cadmium, Chromium, Lead, Selenium, Silver}; ICP Metals - 6010A (Supertrace Add-On) {Antimony, Beryllium, Bismuth, Boron, Copper, Nickel}; Mercury - 7471 - (CV)
(4) IC Anions - 300.0 {Chloride, Fluoride, Nitrate, Nitrite, Phosphate, Sulfate}; Ammonia - 350.3; pH (Soil) - 9045; Total Cyanide - 9010
~~(5) Gamma Spectroscopy {Cesium-137, Cobalt-60, Europium-152, Europium-154, Europium-155}; Gamma Spec - Add-on {Cesium-134, Radium-226, Radium-228, Tin-126}; Total Uranium; Americium-241, Isotopic Plutonium, Isotopic Uranium, Carbon-14, Iodine-129, Nickel-63, Neptunium-237~~ 6-11-3
~~(6) Tech-99, Strontium-89,90, Total Sr, Isotopic Thorium Thorium-232~~

Matrix *
S=Soil
SE=Sediment
SO=Solid
SI=Sludge
W=Water
O=Oil
A=Air
DS=Drum Solids
DL=Drum Liquids
T=Tissue
WI=Wipe
L=Liquid
V=Vegetation
X=Other

LABORATORY SECTION	Received By	Title	Date/Time
FINAL SAMPLE DISPOSITION	Disposal Method	Disposed By	Date/Time

BHI-EE-011 (03/01/2002)

LIONVILLE LABORATORY INCORPORATED
SAMPLE RECEIPT CHECKLIST

LIENT: TNU-HANFORD

urchase Order/Project:

DATE: 6-13-03

AF# / SOW# / Release #: F03-006

aboratory SDG #: 0306L625

OTE: ALL ENTRIES MARKED "NO" MUST BE EXPLAINED IN THE COMMENT SECTION

1.	Custody seals on coolers or shipping container intact, signed and dated?	☑ Yes	☐ No	☐ N/A	☐ see Comment #
2.	Outside of coolers or shipping containers are free from damage?	☑ Yes	☐ No	☐ N/A	☐ see Comment #
3.	Airbill # recorded?	☑ Yes	☐ No	☐ N/A	☐ see Comment #
4.	All expected paperwork received (coc and other client specific: historical data, alpha/beta or other screening data as applicable)? (paperwork sealed in plastic bag and taped to inside lid)	☑ Yes	☐ No	☐ N/A	☐ see Comment #
5.	Sample containers are intact?	☑ Yes	☐ No	☐ N/A	☐ see Comment #
6.	Custody seals on sample containers intact, signed and dated?	☑ Yes	☐ No	☐ N/A	☐ see Comment #
7.	All samples on coc received?	☑ Yes	☐ No	☐ N/A	☐ see Comment #
8.	All sample label information matches coc?	☑ Yes	☐ No	☐ N/A	☐ see Comment #
9.	Laboratory QC samples designated on coc? (QC stickers placed on bottles?)	☑ Yes	☐ No	☐ N/A	☐ see Comment #
10.	Shipment meets LvLI Sample Acceptance Policy? (identify all bottles not within policy. See reverse side for policy)	☑ Yes	☐ No	☐ N/A	☐ see Comment #
11.	Where applicable, bar code labels are affixed to coc?	☐ Yes	☐ No	☑ N/A	☐ see Comment #
12.	coc signed and dated?	☑ Yes	☐ No	☐ N/A	☐ see Comment #
13.	coc will be faxed or emailed to client?	☑ Yes	☐ No	☐ N/A	☐ see Comment #
14.	Project Manager/Client contacted concerning discrepancies? (name/date)	☐ Yes	☐ No	☑ N/A	☐ see Comment #

Cooler # / temp (°C) and Comments:

ERC 01-037 1.5

Laboratory Sample Custodian: Carl Hunt

Laboratory Project Manager:

Lionville Laboratory, Inc.
GRO ANALYTICAL DATA PACKAGE FOR
TNUHANFORD F03-006 H2264

DATE RECEIVED: 06/13/03 LVL LOT # :0306L625

CLIENT ID	LVL #	MTX	PREP #	COLLECTION	EXTR/PREP	ANALYSIS
B161C2	001	S	03LVJ625	06/11/03	N/A	06/25/03
B161C2	001 MS	S	03LVJ625	06/11/03	N/A	06/25/03
B161C2	001 MSD	S	03LVJ625	06/11/03	N/A	06/25/03
LAB QC:						
TBLKKO	MB1	S	03LVJ625	N/A	N/A	06/25/03
TBLKKO	MB1 BS	S	03LVJ625	N/A	N/A	06/25/03

7/8/03

LIONVILLE LABORATORY INC.

Analytical Report

Client: TNU HANFORD F03-006
LVL #: 0306L625
SDG/SAF#: H2264/F03-006

W.O. #: 11343-606-001-9999-00
Date Received: 06-13-03

GASOLINE RANGE ORGANICS

One (1) soil sample was collected on 06-11-03.

The sample and its associated QC samples were prepped and analyzed according to Lionville Laboratory OPs based on SW846 method 8015B for Gasoline range organics (GRO) on 06-25-03. The analysis met the intent of method WTPH-G.

The following is a summary of the QC results accompanying these sample results and a description of any problems encountered during their analyses:

1. All results presented in this report are derived from samples that met LVLI's sample acceptance policy.

2. All required holding times for analysis have been met.

3. The method blank was below the reporting limits for all target compounds.

4. One (1) of five (5) surrogate recoveries was outside acceptance criteria. A copy of the Sample Discrepancy Report (SDR) has been enclosed.

5. The blank spike recovery was within acceptance criteria.

6. All matrix spike recoveries were within acceptance criteria.

7. All initial calibrations associated with this data set were within acceptance criteria.

8. I certify that this sample data package is in compliance with SOW requirements, both technically and for completeness, other than the conditions detailed above. Release of the data contained in this hard-copy data package has been authorized by the laboratory Manager or a designee, as verified by the following signature.

Iain Daniels
Laboratory Manager
Lionville Laboratory Incorporated

7/16/03
Date

pef\Rrgroup\data\gro\tnu\\06L-625.doc

The results presented in this report relate only to the analytical testing and conditions of the samples at receipt and during storage. All pages of this report are integral parts of the analytical data. Therefore, this report should only be reproduced in its entirety of 9 pages.

Lionville Laboratory Sample Discrepancy Report (SDR)

SDR #: 0306247

Initiator: John Lach
Date: 7/11/03
Client: TNU

Batch: 0306L625
Samples: A B BS
Method: SW846/MCAWW/CLP/

Parameter: 0'6&0.
Matrix: SOIL
Prep Batch: 03LV625

1. Reason for SDR

a. COC Discrepancy __ Tech Profile Error __ Client Request __ Sampler Error on C-O-C __ Transcription Error __ Wrong Test Code __ Other _____

b. General Discrepancy

__ Missing Sample/Extract* __ Container Broken __ Wrong Sample Pulled __ Label ID's Illegible
__ Hold Time Exceeded __ Insufficient Sample* __ Preservation Wrong __ Received Past Hold
__ Improper Bottle Type __ Not Amenable to Analysis

Note*: Verified by [Log-In] or [Prep Group] (circle)...signature/date: _____

c. Problem (Include all relevant specific results; attach data if necessary)

Blank double ~~SA~~ surrogate d. No surrogate in Blank Spike. Spikes.

2. Known or Probable Cause(s)

3. Discussion and Proposed Action

__ Re-log
__ Entire Batch
__ Following Samples: _____
__ Re-leach
__ Re-extract
__ Re-digest
__ Revise EDD
__ Change Test Code to _____
__ Place On/Take Off Hold (circle)

Other Description:

Narrate. Re SPike in the Blank Spike in control. Matrix QC in control. No hit in Sample.

4. Project Manager Instructions...signature/date: _____ 7/11/03

✓ Concur with Proposed Action
__ Disagree with Proposed Action; See Instruction
__ Include in Case Narrative
__ Client Contacted:
Date/Person _____
__ Add
__ Cancel

5. Final Action...signature/date: _____

Other Explanation:

__ Verified re-[log][leach][extract][digest][analysis] (circle)
__ Included in Case Narrative
__ Hard Copy COC Revised
__ Electronic COC Revised
__ EDD Corrections Completed

When Final Action has been recorded, forward original to QA Specialist for distribution and filing.

Route	Distribution of Completed SDR	Route	Distribution of Completed SDR
__	X Initiator	__	__ Metals: Beegle
__	X Lab General Manager: M. Taylor	__	__ Inorganic: Perrone
__	X Project Mgr: Stone/Johnson/Haslett	__	__ GC/LC: Kiger
__	X Technical Mgr: Wesson/Daniels	__	__ MS: Rychlak/Layman
__	X QA (file)	__	__ Log-in: Melnic
__	__ *Data Management: Feldman*	__	__ *Admin: Soos*
__	__ Sample Prep: Beegle/Kiger	__	__ Other: _____

GLOSSARY OF PESTICIDE/PCB DATA

DATA QUALIFIERS

U = Indicates that the compound was analyzed for but not detected. The minimum detection limit for the sample (not the method detection limit) is reported with the U (e.g., 10U).

J = Indicates an estimated value. This flag is used in cases where a target analyte is detected at a level less than the lower quantification level. If the limit of quantification is 10 ug/L and a concentration of 3 ug/L is calculated, it is reported as 3J.

B = This flag is used when the analyte is found in the associated blank as well as in the sample. It indicates possible/probable blank contamination.

E = Indicates that the compound was detected beyond the calibration range and was subsequently analyzed at a dilution.

I = Interference.

.I = Indicates an interference on one analytical column only. Result is reported from remaining analytical column.

ABBREVIATIONS

BS = Indicates blank spike in which reagent grade water is spiked with the CLP matrix spiking solutions and carried through all the steps in the method. Spike recoveries are reported.

BSD = Indicates blank spike duplicate.

MS = Indicates matrix spike.

MSD = Indicates matrix spike duplicate.

DL = Indicates that recoveries were not obtained because the extract had to be diluted for analysis.

NA = Not Applicable.

DF = Dilution Factor.

NR = Not Required.

SP = Indicates Spiked Compound.

GLOSSARY OF PESTICIDE/PCB DATA

P = This flag is used for an PESTICIDE/PCB target analyte when there is greater than 25% difference for detected concentrations between the two GC columns (see Form X). The lower of the two values is reported on Form I and flagged with a "P".

D = This flag identifies all compounds identified in an analysis at a secondary dilution factor.

C = This flag applies to a compound that has been confirmed by GC/MS.

Lionville Laboratory, Inc.

GAS RANGE ORGANICS

Report Date: 07/11/03 12:08

RFW Batch Number: **0306L625** Client: **TNUHANFORD F03-006 H2264** Work Order: 11343606001 Page: 1

	Cust ID:	B161C2	B161C2	B161C2	TBLKKO	TBLKKO BS
Sample Information	RFW#:	001	001 MS	001 MSD	03LVJ625-MB1	03LVJ625-MB1
	Matrix:	SOIL	SOIL	SOIL	SOIL	SOIL
	D.F.:	1.00	1.00	1.00	1.00	1.00
	Units:	UG/KG	UG/KG	UG/KG	UG/KG	UG/KG
Fluorobenzene		85 %	65 %	82 %	95 %	0 * %
Gasoline Range Organics (GRO)		29 U	99 %	74 %	30 U	111 %

U= Analyzed, not detected. J= Present below detection limit. B= Present in blank. NR= Not reported. NS= Not spiked.
%= Percent recovery. D= Diluted out. I= Interference. NA= Not Applicable. *= Outside of EPA CLP QC

Lionville Laboratory Use Only

03064625

Custody Transfer Record/Lab Work Request

Page 1 of 1

LVLI LIONVILLE LABORATORY INC.

FIELD PERSONNEL: COMPLETE ONLY SHADED AREAS

Client TNU-HANFORD F03-006

Est. Final Proj. Sampling Date

Project # 11343-606-001-9999-00

Project Contact/Phone #

Lionville Laboratory Project Manager OJ

QC SPEC Del STD TAT 30 days

Date Rec'd 6-13-03 Date Due 7-17-03

		A			B		C		D	E
Refrigerator #		2	1						1	2
#/Type Container	Liquid									
	Solid	1AG			1AG		1AG		1AG	1AG
Volume	Liquid									
	Solid	125			60		60		125	60
Preservatives										
ANALYSES REQUESTED	ORGANIC: VOA	BNA	Pest/PCB	Herb	Alcohols Glycols Ketones	INORG: ICP Metal	CN		I.C Anions	NO2 NO3

MATRIX CODES: S - Soil, SE - Sediment, SO - Solid, SL - Sludge, W - Water, O - Oil, A - Air, DS - Drum Solids, DL - Drum Liquids, L - EP/TCLP Leachate, WI - Wipe, X - Other, F - Fish

Lab ID	Client ID/Description	MS	MSD	Matrix	Date Collected	Time Collected		0625X 0DRO 0GRO			OGCSC		METO		INORGO	INH3N2 IOGGIC ICR6
001	B161C2	✓	✓	S	6-11-03	0925		1			1		1		1	1

Special Instructions: SAF # F03-006

MET ①: RCRA + Sb, Be, Bi, B, Cu, Ni

INORG ①: IC: Cl, F, NO3, NO2, PO4, SO4
INH3N, IPH, ICN?O

DATE/REVISIONS:
1.
2.
3.
4.
5.
6.

Lionville Laboratory Use Only

Samples were: 1) Shipped ✓ or Hand Delivered ___ Airbill # See below
2) Ambient or (Chilled)
3) Received in Good Condition (Y) or N
4) Samples Properly Preserved (Y) or N
5) Received Within Holding Times (Y) or N

Tamper Resistant Seal was:
1) Present on Outer Package (Y) or N
2) Unbroken on Outer Package (Y) or N
3) Present on Sample (Y) or N
4) Unbroken on Sample (Y) or N
COC Record Present Upon Sample Rec't (Y) or N
Cooler Temp. 1.5 °C

Relinquished by	Received by	Date	Time
FEDEX	[signature]	6-13-03	0910

Relinquished by	Received by	Date	Time
COMPOSITE WASTE		ORIGINAL REWRITTEN	

Discrepancies Between Samples Labels and COC Record? Y or (N)

NOTES: 7929 0769 7042

FH-Central Plateau Project	CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST	F03-006-189	Page 1 of 1

Collector	Company Contact / Telephone No.	Project Coordinator	Price Code / Data Turnaround
Johansen/Pope/Pfister/Hughes	LC Hulstrom 373-3928	TRENT, SJ	8N / 45 Days
Project Designation	**Sampling Location**	**SAF No.**	**Air Quality** ☐
200-PW-2/200-PW-4 OU - Borehole Soil Sampling	216-B-12 (C3246); 197.5-200	F03-006	
Ice Chest No.	**Field Logbook No.** / **COA**	**Method of Shipment**	
ERC 01-037	HNF-N-3361 / 117504ES10	Federal Express	
Shipped To	**Offsite Property No.**	**Bill of Lading/Air Bill No.**	
~~EBERLINE SERVICES (Formerly TMA)~~ Perma	A030286	SEE OSPC	

POSSIBLE SAMPLE HAZARDS/REMARKS

RADIOACTIVE TIE TO: B171P5

Special Handling and/or Storage

Cool 4C

Preservation	Cool 4C	Cool 4C	None	Cool 4C	Cool 4C	None	None	None		
Type of Container	aG	aG	aG	aG	aG	aG	aG	aG		
No. of Container(s)	1	1	1	1	1	1	1	1		
Volume	60mL	125mL	60mL	125mL	60mL	60mL	60mL	60mL		
SAMPLE ANALYSIS	See item (1) in Special Instructions.	See item (2) in Special Instructions.	See item (3) in Special Instructions.	See item (4) in Special Instructions.	NO2/NO3 - 353.2; Oil & Grease - 413.1; Chromium Hex - 7196	See item (5) in Special Instructions.	See item (6) in Special Instructions.	Tritium - H3		
Sample No.	Matrix *	Sample Date	Sample Time							
B161C2	SOIL	6-11-3	0925	X	X	X	X	X		

CHAIN OF POSSESSION

Relinquished By/Removed From	Date/Time	Received By/Stored In	Date/Time
R. Pfister	6/11/3 1417	[illegible]	6/11/03 1417
[illegible]	6/11/03 1417	R. Fahlberg	6.11.03 1417
R. Fahlberg	6.11.03 1417	1B 3228	6.11.03 1417
1B 3228	6.11.03 1200	R. Fahlberg	6.12.03 1200
R. Fahlberg	6.12.03 1200	Fed Ex	
Fed Ex	6-13-03 0910	[illegible]	6-13-03 0910

SPECIAL INSTRUCTIONS 6-11-3

~~The lab is to achieve a detection limit of 50.0 pCi/g for C-14~~. Report kerosene and diesel range compounds from WTPH-D analysis. FH acknowledges that holding times (less than 14 days) may not be met by the lab due to the radi characteristics.

(1) Alcohols, Glycols, & Ketones - 8015 {1-Butanol, Diethyl ether, Ethylene glycol, Methanol}
(2) Semi-VOA - 8270A (TCL); Semi-VOA – 8270A (Add-On) {2-Butoxyethanol, Tributyl phosphate}; TPH-Diesel Range - WTPH-D; TPH-Gasoline Range - WTPH-G
(3) ICP Metals - 6010A (*Supertrace*) {Arsenic, Barium, Cadmium, Chromium, Lead, Selenium, Silver}; ICP Metals - 6010A (Supertrace Add-On) {Antimony, Beryllium, Bismuth, Boron, Copper, Nickel}; Mercury - 7471 - (CV)
(4) IC Anions - 300.0 {Chloride, Fluoride, Nitrate, Nitrite, Phosphate, Sulfate}; Ammonia - 350.3; pH (Soil) - 9045; Total Cyanide - 9010
(5) ~~Gamma Spectroscopy {Cesium-137, Cobalt-60, Europium-152, Europium-154, Europium-155}; Gamma Spec - Add-on {Cesium-134, Radium-226, Radium-228, Thr126}; Total Uranium; Americium-241, Isotopic Plutonium, Isotopic Uranium~~ [illegible]
(6) ~~Tech-99, Strontium-89,90, Total Sr~~ [illegible]

6-11-3

Matrix *
S=Soil
SE=Sediment
SO=Solid
SI=Sludge
W = Water
O=Oil
A=Air
DS=Drum Solids
DL=Drum Liquids
T=Tissue
WI=Wipe
L=Liquid
V=Vegetation
X=Other

LABORATORY SECTION	Received By	Title	Date/Time
FINAL SAMPLE DISPOSITION	Disposal Method	Disposed By	Date/Time

BHI-EE-011 (03/01/2002)

LIONVILLE LABORATORY INCORPORATED
SAMPLE RECEIPT CHECKLIST

IENT: TNU-HANFORD

rchase Order/Project:

DATE: 6-13-03

F# / SOW# / Release #: F03-006

boratory SDG #: 0306L625

OTE: ALL ENTRIES MARKED "NO" MUST BE EXPLAINED IN THE COMMENT SECTION

1.	Custody seals on coolers or shipping container intact, signed and dated?,	☑ Yes	☐ No	☐ N/A	☐ see Comment #
2.	Outside of coolers or shipping containers are free from damage?	☑ Yes	☐ No	☐ N/A	☐ see Comment #
3.	Airbill # recorded?	☑ Yes	☐ No	☐ N/A	☐ see Comment #
4.	All expected paperwork received (coc and other client specific: historical data, alpha/beta or other screening data as applicable)? (paperwork sealed in plastic bag and taped to inside lid)	☑ Yes	☐ No	☐ N/A	☐ see Comment #
5.	Sample containers are intact?	☑ Yes	☐ No	☐ N/A	☐ see Comment #
6.	Custody seals on sample containers intact, signed and dated?	☑ Yes	☐ No	☐ N/A	☐ see Comment #
7.	All samples on coc received?	☑ Yes	☐ No	☐ N/A	☐ see Comment #
8.	All sample label information matches coc?	☑ Yes	☐ No	☐ N/A	☐ see Comment #
9.	Laboratory QC samples designated on coc? (QC stickers placed on bottles?)	☑ Yes	☐ No	☐ N/A	☐ see Comment #
10.	Shipment meets LvL1 Sample Acceptance Policy? (identify all bottles not within policy. See reverse side for policy)	☑ Yes	☐ No	☐ N/A	☐ see Comment #
11.	Where applicable, bar code labels are affixed to coc?	☐ Yes	☐ No	☑ N/A	☐ see Comment #
12.	coc signed and dated?	☑ Yes	☐ No	☐ N/A	☐ see Comment #
13.	coc will be faxed or emailed to client?	☑ Yes	☐ No	☐ N/A	☐ see Comment #
14.	Project Manager/Client contacted concerning discrepancies? (name/date)	☐ Yes	☐ No	☑ N/A	☐ see Comment #

Cooler # / temp (°C) and Comments:

ERC 01-037 1.5

Laboratory Sample Custodian: Carl Hunt

Laboratory Project Manager:

Lionville Laboratory, Inc.
GCSC ANALYTICAL DATA PACKAGE FOR
TNUHANFORD F03-006 H2264

DATE RECEIVED: 06/13/03 LVL LOT # :0306L625

CLIENT ID	LVL #	MTX	PREP #	COLLECTION	EXTR/PREP	ANALYSIS
B161C2	001	S	03LE0764	06/11/03	06/25/03	07/07/03
B161C2	001 MS	S	03LE0764	06/11/03	06/25/03	07/07/03
B161C2	001 MSD	S	03LE0764	06/11/03	06/25/03	07/07/03
LAB QC:						
BLK	MB1	S	03LE0764	N/A	06/25/03	07/07/03
BLK	MB1 BS	S	03LE0764	N/A	06/25/03	07/07/03

LIONVILLE LABORATORY INC.

Analytical Report

Client: TNU HANFORD F03-006
LVL#: 0306L625
SDG/SAF#: H2264/F03-006

W.O.#: 11343-606-001-9999-00
Date Received: 06-13-03

GC SCAN

One (1) soil sample was collected on 06-11-03.

The sample and its associated QC samples were extracted and analyzed on 06-25-03 according to Lionville Laboratory OPs based on SW846, 3rd Edition procedures. The extraction procedure was based on method 3580a (waste dilution – 1 g into 5 mLs) and the extracts were analyzed based on method 8015B for Methanol, Ethyl Ether, and 1-Butanol.

The following is a summary of the QC results accompanying these sample results and a description of any problems encountered during their analyses:

1. All results presented in this report are derived from samples that met LvLI's sample acceptance policy.

2. All required holding times for extraction and analysis have been met.

3. The method blank was below the reporting limits for all target compounds.

4. Surrogates are not currently employed in the methodology.

5. All blank spike recoveries were within acceptance criteria.

6. Two (2) of six (6) matrix spike recoveries were outside acceptance criteria. A copy of the Sample Discrepancy Report (SDR) has been enclosed.

7. All initial calibrations were within acceptance criteria.

8. I certify that this sample data package is in compliance with SOW requirements, both technically and for completeness, other than the conditions detailed above. Release of the data contained in this hard-copy data package has been authorized by the laboratory Manager or a designee, as verified by the following signature.

Iain Daniels
Laboratory Manager
Lionville Laboratory Incorporated

7/15/03
Date

r:\group\data\gcsc\06L-625b.doc

Lionville Laboratory Sample Discrepancy Report (SDR)

SDR #: 036C245

Initiator: John Lech. Batch: 0306L625, 636, 672 Parameter: OGCSC
Date: 7/11/07 Samples: all matrix QC Matrix: SO-1
Client: TAU - Hunter's Method: SW846/MCAWW/CLP/ Prep Batch: 03LE0764

1. Reason for SDR

a. COC Discrepancy __ Tech Profile Error __ Client Request __ Sampler Error on C-O-C __ Transcription Error __ Wrong Test Code __ Other _____

b. General Discrepancy

__ Missing Sample/Extract* __ Container Broken __ Wrong Sample Pulled __ Label ID's Illegible
__ Hold Time Exceeded __ Insufficient Sample* __ Preservation Wrong __ Received Past Hold
__ Improper Bottle Type __ Not Amenable to Analysis

Note*: Verified by [Log-In] or [Prep Group] (circle)...signature/date: _____

c. Problem (Include all relevant specific results; attach data if necessary)

matrix QC Decreased for Ethylene.

625-0015 30%
0015T 26%
636 0015 32%
0015T 33%

2. Known or Probable Causes(s)

matrix effects.

3. Discussion and Proposed Action

__ Re-log
__ Entire Batch
__ Following Samples: _____
__ Re-leach
__ Re-extract
__ Re-digest
__ Revise EDD
__ Change Test Code to _____
__ Place On/Take Off Hold (circle)

Other Description:

Matrix. Blank Spike in control.
No hits in samples 7½ reporting Limit

4. Project Manager Instructions...signature/date: _____

✓ Concur with Proposed Action
__ Disagree with Proposed Action; See Instruction
__ Include in Case Narrative
__ Client Contacted:
Date/Person _____
__ Add
__ Cancel

5. Final Action...signature/date: 7.31.07

Other Explanation:

__ Verified re-[log][leach][extract][digest][analysis] (circle)
✓ Included in Case Narrative
__ Hard Copy COC Revised
__ Electronic COC Revised
__ EDD Corrections Completed

When Final Action has been recorded, forward original to QA Specialist for distribution and filing.

Route	Distribution of Completed SDR	Route	Distribution of Completed SDR
__	X Initiator	__	__ Metals: Beegle
__	X Lab General Manager: M. Taylor	__	__ Inorganic: Perrone
__	X Project Mgr: Stone/Johnson/Haslett	__	__ GC/LC: Kiger
__	X Technical Mgr: Wesson/Daniels	__	__ MS: Rychlak/Layman
__	X QA (file)	__	__ Log-in: Melnic
__	__ Data Management: Feldman	__	__ Admin: Soos
__	__ Sample Prep: Beegle/Kiger	__	__ Other: _____

GLOSSARY OF PESTICIDE/PCB DATA

DATA QUALIFIERS

U = Indicates that the compound was analyzed for but not detected. The minimum detection limit for the sample (not the method detection limit) is reported with the U (e.g., 10U).

J = Indicates an estimated value. This flag is used in cases where a target analyte is detected at a level less than the lower quantification level. If the limit of quantification is 10 ug/L and a concentration of 3 ug/L is calculated, it is reported as 3J.

B = This flag is used when the analyte is found in the associated blank as well as in the sample. It indicates possible/probable blank contamination.

E = Indicates that the compound was detected beyond the calibration range and was subsequently analyzed at a dilution.

I = Interference.

.I = Indicates an interference on one analytical column only. Result is reported from remaining analytical column.

ABBREVIATIONS

BS = Indicates blank spike in which reagent grade water is spiked with the CLP matrix spiking solutions and carried through all the steps in the method. Spike recoveries are reported.

BSD = Indicates blank spike duplicate.

MS = Indicates matrix spike.

MSD = Indicates matrix spike duplicate.

DL = Indicates that recoveries were not obtained because the extract had to be diluted for analysis.

NA = Not Applicable.

DF = Dilution Factor.

NR = Not Required.

SP = Indicates Spiked Compound.

GLOSSARY OF PESTICIDE/PCB DATA

P = This flag is used for an PESTICIDE/PCB target analyte when there is greater than 25% difference for detected concentrations between the two GC columns (see Form X). The lower of the two values is reported on Form I and flagged with a "P".

D = This flag identifies all compounds identified in an analysis at a secondary dilution factor.

C = This flag applies to a compound that has been confirmed by GC/MS.

Lionville Laboratory, Inc.

GC SCAN

Report Date: 07/11/03 11:45

RFW Batch Number: **0306L625** Client: **TNUHANFORD F03-006 H2264** Work Order: 11343606001 Page: 1

	Cust ID:	B161C2	B161C2	B161C2	BLK	BLK BS
Sample Information	RFW#:	001	001 MS	001 MSD	03LE0764-MB1	03LE0764-MB1
	Matrix:	SOIL	SOIL	SOIL	SOIL	SOIL
	D.F.:	1.00	1.00	1.00	1.00	1.00
	Units:	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg

Methanol	24	U	96	%	94	%	25	U	102	%
Ethyl Ether	24	U	30 *	%	26 *	%	25	U	50	%
1-Butanol	24	U	98	%	95	%	25	U	98	%

U= Analyzed, not detected. J= Present below detection limit. B= Present in blank. NR= Not reported. NS= Not spiked.
%= Percent recovery. D= Diluted out. I= Interference. NA= Not Applicable. *= Outside of EPA CLP QC

Lionville Laboratory Use Only

0306L625

Custody Transfer Record/Lab Work Request

Page 1 of 1

LvLI LIONVILLE LABORATORY INC.

FIELD PERSONNEL: COMPLETE ONLY SHADED AREAS

Client TNU-HANFORD F03-006

Est. Final Proj. Sampling Date

Project # 11343-606-001-9999-00

Project Contact/Phone #

Lionville Laboratory Project Manager OJ

QC SPEC Del STD TAT 30 days

Date Rec'd 6-13-03 Date Due 7-17-03

		A	B	C	D	E
Refrigerator #		2			1	2
#/Type Container	Liquid					
	Solid	1AG	1AG	1AG	1AG	1AG
Volume	Liquid					
	Solid	125	60	60	125	60
Preservatives						
ANALYSES REQUESTED		ORGANIC: VOA, BNA, Pest/PCB, Herb	alcohols glycols ketones	INORG: ICP Metal, CN	I.C Anions	NO2 NO3 O-P Cr6

MATRIX CODES: S - Soil; SE - Sediment; SO - Solid; SL - Sludge; W - Water; O - Oil; A - Air; DS - Drum Solids; DL - Drum Liquids; L - EP/TCLP Leachate; WI - Wipe; X - Other; F - Fish

Lionville Laboratory Use Only: 0625X 0DRO 0GRO | 0GCSC | MET① | INORG① | INH3N ZOGGK ICR6

Lab ID	Client ID/Description	MS	MSD	Matrix	Date Collected	Time Collected	VOA	BNA	Pest/PCB	Herb	Alcohols/glycols/ketones			ICP Metal	CN	I.C Anions	NO2 NO3 O-P Cr6
001	B161C2	✓	✓	S	6-11-03	0925		1			1			1		1	1

Special Instructions: SAF # F03-006

MET ①: RCRA + Sb, Be, Bi, B, Cu, Ni

INORG ①: IC: Cl, F, NO3, NO2, PO4, SO4

INH3N, ZPH, ICN10

DATE/REVISIONS:
1.
2.
3.
4.
5.
6.

Lionville Laboratory Use Only

Samples were:
1) Shipped ✓ or Hand Delivered ___
Airbill # SEE BELOW
2) Ambient or (Chilled)
3) Received in Good Condition (Y) or N
4) Samples Properly Preserved (Y) or N
5) Received Within Holding Times (Y) or N

Tamper Resistant Seal was:
1) Present on Outer Package (Y) or N
2) Unbroken on Outer Package (Y) or N
3) Present on Sample (Y) or N
4) Unbroken on Sample (Y) or N
COC Record Present Upon Sample Rec't (Y) or N
Cooler Temp. 1.5 °C

Relinquished by	Received by	Date	Time	Relinquished by	Received by	Date	Time
FEDEX	[signature]	6-13-03	0910				

COMPOSITE WASTE

ORIGINAL REWRITTEN

Discrepancies Between Samples Labels and COC Record? Y or (N)

NOTES: 7929 0769 7042

FH-Central Plateau Project	CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST	F03-006-189	Page 1 of 1

Collector 6-11-3 Johansen/Pope/Pfister/Hughes	Company Contact / Telephone No. LC Hulstrom 373-3928	Project Coordinator TRENT, SJ	Price Code 8N	Data Turnaround 45 Days
Project Designation 200-PW-2/200-PW-4 OU - Borehole Soil Sampling	Sampling Location 216-B-12 (C3246); 197.5-200	SAF No. F03-006	Air Quality ☐	
Ice Chest No. ERC 01-037	Field Logbook No. HNF-N-3361 / COA 117504ES10	Method of Shipment Federal Express		
Shipped To 6-9-03 EBERLINE SERVICES (Formerly TMA) Perea	Offsite Property No. A030286	Bill of Lading/Air Bill No. SEE 05PC		

POSSIBLE SAMPLE HAZARDS/REMARKS

RADIOACTIVE TIE TO: B171P5

Special Handling and/or Storage

Cool 4C

Preservation	Cool 4C	Cool 4C	None	Cool 4C	Cool 4C	None	None	None		
Type of Container	aG	aG	aG	aG	aG	aG	aG	aG		
No. of Container(s)	1	1	1	1	1	1	1	1		
Volume	60mL	125mL	60mL	125mL	60mL	60mL	60mL	60mL		
SAMPLE ANALYSIS	See item (1) in Special Instructions.	See item (2) in Special Instructions.	See item (3) in Special Instructions.	See item (4) in Special Instructions.	NO2/NO3 - 353.2; Oil & Grease - 413.1; Chromium Hex - 7196	See item (5) in Special Instructions.	See item (6) in Special Instructions.	Tritium - H3		
Sample No.	Matrix *	Sample Date	Sample Time							
B161C2	SOIL	6-11-3	0925	X	X	X	X	X		

CHAIN OF POSSESSION — **Sign/Print Names**

Relinquished By/Removed From	Date/Time	Received By/Stored In	Date/Time
R. Pfister	6/11/3 1417		6/11/03 1417
	6/11/03 1417	R. Fahlberg	6.11.03 1417
R. Fahlberg	6.11.03 1417	1B 3228	6.11.03 1417
1B 3228	6.12.03 1200	R. Fahlberg	6.12.03 1200
R. Fahlberg	6.12.03 1200	Fed Ex	
Fed Ex	6-13-03 0910		6-13-03 0910

SPECIAL INSTRUCTIONS 6-11-3

~~The lab is to achieve a detection limit of 50.0 pCi/g for C-14.~~ Report kerosene and diesel range compounds from WTPH-D analysis. FH acknowledges that holding times (less than 14 days) may not be met by the lab due to the radl characteristics.

(1) Alcohols, Glycols, & Ketones - 8015 {1-Butanol, Diethyl ether, Ethylene glycol, Methanol}
(2) Semi-VOA - 8270A (TCL); Semi-VOA -- 8270A (Add-On) {2-Butoxyethanol, Tributyl phosphate}; TPH-Diesel Range - WTPH-D; TPH-Gasoline Range - WTPH-G
(3) ICP Metals - 6010A (Supertrace) {Arsenic, Barium, Cadmium, Chromium, Lead, Selenium, Silver}; ICP Metals - 6010A (Supertrace Add-On) {Antimony, Beryllium, Bismuth, Boron, Copper, Nickel}; Mercury - 7471 - (CV)
(4) IC Anions - 300.0 {Chloride, Fluoride, Nitrate, Nitrite, Phosphate, Sulfate}; Ammonia - 350.3; pH (Soil) - 9045; Total Cyanide - 9010
(5) ~~Gamma Spectroscopy (Cesium-137, Cobalt-60, Europium-152, Europium-154, Europium-155); Gamma Spec - Add-on (Cesium-134, Radium-226, Radium-228, Tin-126); Total Uranium; Americium-241, Isotopic Plutonium, Isotopic Uranium; Cobalt-60, Iodine-129, Nickel-63, Neptunium-237 (6) Tech-99, Strontium-89,90, Total Sr, Isotopic Thorium, Thorium-228~~

Matrix *
S=Soil
SE=Sediment
SO=Solid
SL=Sludge
W = Water
O=Oil
A=Air
DS=Drum Solids
DL=Drum Liquids
T=Tissue
WI=Wipe
L=Liquid
V=Vegetation
X=Other

6-11-3

LABORATORY SECTION	Received By	Title	Date/Time
FINAL SAMPLE DISPOSITION	Disposal Method	Disposed By	Date/Time

BHI-EE-011 (03/01/2002)

LIONVILLE LABORATORY INCORPORATED
SAMPLE RECEIPT CHECKLIST

LIENT: TNU-HANFORD

urchase Order/Project:

DATE: 6-13-03

AF# / SOW# / Release #: F03-006

aboratory SDG #: 0306L625

OTE: ALL ENTRIES MARKED "NO" MUST BE EXPLAINED IN THE COMMENT SECTION

1.	Custody seals on coolers or shipping container intact, signed and dated?	☑ Yes	☐ No	☐ N/A	☐ see Comment #
2.	Outside of coolers or shipping containers are free from damage?	☑ Yes	☐ No	☐ N/A	☐ see Comment #
3.	Airbill # recorded?	☑ Yes	☐ No	☐ N/A	☐ see Comment #
4.	All expected paperwork received (coc and other client specific: historical data, alpha/beta or other screening data as applicable)? (paperwork sealed in plastic bag and taped to inside lid)	☑ Yes	☐ No	☐ N/A	☐ see Comment #
5.	Sample containers are intact?	☑ Yes	☐ No	☐ N/A	☐ see Comment #
6.	Custody seals on sample containers intact, signed and dated?	☑ Yes	☐ No	☐ N/A	☐ see Comment #
7.	All samples on coc received?	☑ Yes	☐ No	☐ N/A	☐ see Comment #
8.	All sample label information matches coc?	☑ Yes	☐ No	☐ N/A	☐ see Comment #
9.	Laboratory QC samples designated on coc? (QC stickers placed on bottles?)	☑ Yes	☐ No	☐ N/A	☐ see Comment #
10.	Shipment meets LvLJ Sample Acceptance Policy? (identify all bottles not within policy. See reverse side for policy)	☑ Yes	☐ No	☐ N/A	☐ see Comment #
11.	Where applicable, bar code labels are affixed to coc?	☐ Yes	☐ No	☑ N/A	☐ see Comment #
12.	coc signed and dated?	☑ Yes	☐ No	☐ N/A	☐ see Comment #
13.	coc will be faxed or emailed to client?	☑ Yes	☐ No	☐ N/A	☐ see Comment #
14.	Project Manager/Client contacted concerning discrepancies? (name/date)	☐ Yes	☐ No	☑ N/A	☐ see Comment #

Cooler # / temp (°C) and Comments:

ERC 01-037 1.5

Laboratory Sample Custodian: Carl Hung

Laboratory Project Manager:

Lionville Laboratory, Inc.
8015 ANALYTICAL DATA PACKAGE FOR
TNUHANFORD F03-006 H2264

DATE RECEIVED: 06/13/03 LVL LOT # :0306L625

CLIENT ID	LVL #	MTX	PREP #	COLLECTION	EXTR/PREP	ANALYSIS
B161C2	001	S	03LE0763	06/11/03	06/25/03	06/25/03
B161C2	001 MS	S	03LE0763	06/11/03	06/25/03	06/25/03
B161C2	001 MSD	S	03LE0763	06/11/03	06/25/03	06/25/03
LAB QC:						
BLK	MB1	S	03LE0763	N/A	06/25/03	06/25/03
BLK	MB1 BS	S	03LE0763	N/A	06/25/03	06/25/03

LIONVILLE LABORATORY INC.

Analytical Report

Client: TNU HANFORD F03-006
LVL#: 0306L625
SDG/SAF#: H2264/F03-006

W.O.#: 11343-606-001-9999-00
Date Received: 06-13-03

GC SCAN-Ethylene Glycol

The set of samples consisted of two (2) soil samples collected on 6-11-03.

The samples and their associated QC samples were prepped and analyzed on 06-25-03 03 according to Lionville Laboratory OPs based on SW846, 3rd Edition procedures. The extraction procedure was based on method 3580A (waste dilution –1 g into 5 mL water) and the extracts were analyzed based on method 8015B for Ethylene Glycol.

The following is a summary of the QC results accompanying these sample results and a description of any problems encountered during their analyses:

1. All results presented in this report are derived from samples that met LvLI's sample acceptance policy.

2. All required holding times for extraction and analysis have been met.

3. The method blank was below the reporting limits for all target compounds.

4. Surrogates are not currently employed in the methodology.

5. The blank spike recovery was within acceptance criteria.

6. All matrix spike recoveries were within acceptance criteria.

7. All initial calibrations were within acceptance criteria.

8. I certify that this sample data package is in compliance with SOW requirements, both technically and for completeness, other than the conditions detailed above. Release of the data contained in this hard-copy data package has been authorized by the laboratory Manager or a designee, as verified by the following signature.

Iain Daniels
Laboratory Manager
Lionville Laboratory Incorporated

7/14/03
Date

r:\group\data\gcsc\06L-625a.doc

GLOSSARY OF PESTICIDE/PCB DATA

DATA QUALIFIERS

U = Indicates that the compound was analyzed for but not detected. The minimum detection limit for the sample (not the method detection limit) is reported with the U (e.g., 10U).

J = Indicates an estimated value. This flag is used in cases where a target analyte is detected at a level less than the lower quantification level. If the limit of quantification is 10 ug/L and a concentration of 3 ug/L is calculated, it is reported as 3J.

B = This flag is used when the analyte is found in the associated blank as well as in the sample. It indicates possible/probable blank contamination.

E = Indicates that the compound was detected beyond the calibration range and was subsequently analyzed at a dilution.

I = Interference.

.I = Indicates an interference on one analytical column only. Result is reported from remaining analytical column.

ABBREVIATIONS

BS = Indicates blank spike in which reagent grade water is spiked with the CLP matrix spiking solutions and carried through all the steps in the method. Spike recoveries are reported.

BSD = Indicates blank spike duplicate.

MS = Indicates matrix spike.

MSD = Indicates matrix spike duplicate.

DL = Indicates that recoveries were not obtained because the extract had to be diluted for analysis.

NA = Not Applicable.

DF = Dilution Factor.

NR = Not Required.

SP = Indicates Spiked Compound.

GLOSSARY OF PESTICIDE/PCB DATA

P = This flag is used for an PESTICIDE/PCB target analyte when there is greater than 25% difference for detected concentrations between the two GC columns (see Form X). The lower of the two values is reported on Form I and flagged with a "P".

D = This flag identifies all compounds identified in an analysis at a secondary dilution factor.

C = This flag applies to a compound that has been confirmed by GC/MS.

Lionville Laboratory, Inc.

Nonhalogenated Volatiles by GC, Method 8015 Report Date: 07/11/03 11:41

RFW Batch Number: **0306L625** Client: **TNUHANFORD F03-006 H2264** Work Order: 11343606001 Page: 1

	Cust ID:	B161C2	B161C2	B161C2	BLK	BLK BS
Sample Information	RFW#:	001	001 MS	001 MSD	03LE0763-MB1	03LE0763-MB1
	Matrix:	SOIL	SOIL	SOIL	SOIL	SOIL
	D.F.:	1.00	1.00	1.00	1.00	1.00
	Units:	ug/Kg	ug/Kg	ug/Kg	ug/Kg	ug/Kg
Ethylene Glycol		22.5 U	107 %	96 %	25.0 U	83 %

U= Analyzed, not detected. J= Present below detection limit. B= Present in blank. NR= Not reported. NS= Not spiked.
%= Percent recovery. D= Diluted out. I= Interference. NA= Not Applicable. *= Outside of EPA CLP QC

Lionville Laboratory Use Only
03061625

Custody Transfer Record/Lab Work Request

Page 1 of 1

LVLI 9
LIONVILLE LABORATORY INC.

FIELD PERSONNEL: COMPLETE ONLY SHADED AREAS

Client TNU-HANFORD F03-006
Est. Final Proj. Sampling Date
Project # 11343-606-001-9999-00
Project Contact/Phone #
Lionville Laboratory Project Manager OJ
QC SPEC Del STD TAT 30 days
Date Rec'd 6-13-03 Date Due 7-17-03

		A				B		C		D	E
Refrigerator #		2	1							1	2
#/Type Container	Liquid										
	Solid	1AG				1AG		1AG		1AG	1AG
Volume	Liquid										
	Solid	125				60		60		125	60
Preservatives											
ANALYSES REQUESTED →		ORGANIC: BNA	Pest/PCB	Herb		Alcohols glycols ketones		INORG: ICP Metal	CN	I.C. Anions	NO2 NO3 OrgC Cr6
	VOA										

MATRIX CODES:
S - Soil
SE - Sediment
SO - Solid
SL - Sludge
W - Water
O - Oil
A - Air
DS - Drum Solids
DL - Drum Liquids
L - EP/TCLP Leachate
WI - Wipe
X - Other
F - Fish

Lionville Laboratory Use Only: 0625X OPRO OGRO | OGCSC | MET© | INORG© | INNH2 IOGGR ICR6

Lab ID	Client ID/Description	MS	MSD	Matrix	Date Collected	Time Collected	VOA	BNA	Pest/PCB	Herb	Alcohols		ICP Metal	CN	I.C. Anions	NO2/NO3
001	B161C2	✓	✓	S	6-11-03	0925		1			1		1		1	1

Special Instructions: SAF # F03-006

MET©: RCRA + Sb. Be. Bi. B. Cu. Ni
INORG©: IC: Cl, F, NO3, NO2, PO4, SO4
INH3N, IPH, ICNTO

DATE/REVISIONS:
1.
2.
3.
4.
5.
6.

Relinquished by	Received by	Date	Time
FEDEX	[signature]	6-13-03	0910

Relinquished by	Received by	Date	Time
COMPOSITE WASTE		ORIGINAL REWRITTEN	

Discrepancies Between Samples Labels and COC Record? Y or (N)
NOTES:
7929 0769 7042

Lionville Laboratory Use Only

Samples were:
1) Shipped ✓ or Hand Delivered
Airbill # SEE BELOW
2) Ambient or (Chilled)
3) Received in Good Condition (Y) or N
4) Samples Properly Preserved (Y) or N
5) Received Within Holding Times (Y) or N

Tamper Resistant Seal was:
1) Present on Outer Package (Y) or N
2) Unbroken on Outer Package (Y) or N
3) Present on Sample (Y) or N
4) Unbroken on Sample (Y) or N
COC Record Present Upon Sample Rec't (Y) or N
Cooler Temp. 1.5 °C

FH-Central Plateau Project	CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST	F03-006-189	Page 1 of 1

Collector RP 6-11-3 ~~Johansen~~/Pope/Pfister/Hughes	Company Contact LC Hulstrom · Telephone No. 373-3928	Project Coordinator TRENT, SJ	Price Code 8N · Data Turnaround 45 Days
Project Designation 200-PW-2/200-PW-4 OU - Borehole Soil Sampling	Sampling Location 216-B-12 (C3246); 197.5-200	SAF No. F03-006	Air Quality ☐
Ice Chest No. ERC 01-037	Field Logbook No. HNF-N-3361 · COA 117504ES10	Method of Shipment Federal Express	
Shipped To TMS 6-9-03 ~~EBERLINE SERVICES (Formerly TMA)~~ Recra	Offsite Property No. A030286	Bill of Lading/Air Bill No. SEE OSPC	

POSSIBLE SAMPLE HAZARDS/REMARKS

RADIOACTIVE TIE TO: B171P5

Special Handling and/or Storage

Cool 4C

Preservation	Cool 4C	Cool 4C	None	Cool 4C	Cool 4C	None	None	None		
Type of Container	aG	aG	aG	aG	aG	aG	aG	aG		
No. of Container(s)	1	1	1	1	1	1	1	1		
Volume	60mL	125mL	60mL	125mL	60mL	60mL	60mL	60mL		
SAMPLE ANALYSIS	See item (1) in Special Instructions.	See item (2) in Special Instructions.	See item (3) in Special Instructions.	See item (4) in Special Instructions.	NO2/NO3 - 353.2; Oil & Grease - 413.1; Chromium Hex - 7196	See item (5) in Special Instructions.	See item (6) in Special Instructions.	Tritium - H3		

Sample No.	Matrix *	Sample Date	Sample Time										
B161C2	SOIL	6-11-3	0925	X	X	X	X	X					

CHAIN OF POSSESSION	Date/Time	Sign/Print Names Received By/Stored In	Date/Time
Relinquished By/Removed From R. PFISTER/[signature]	6/11/3 1417	[signature]	6/11/03 1417
Relinquished By/Removed From [signature]	6/11/03 1417	R. Fehlberg [signature]	6.11.03 1417
Relinquished By/Removed From R. Fehlberg [signature]	6.11.03 1417	1B 3228	6.11.03 1417
Relinquished By/Removed From 1B 3228	6.12.03 1200	R. Fehlberg [signature]	6.12.03 1200
Relinquished By/Removed From ERC R. Fehlberg [signature]	6.12.03 1200	Fed Ex	
Relinquished By/Removed From FED EX	6-13-03 0910	[signature]	6-13-03 0910

SPECIAL INSTRUCTIONS RP 6-11-3

~~The lab is to achieve a detection limit of 50.0 pCi/g for C-14~~. Report kerosene and diesel range compounds from WTPH-D analysis. FH acknowledges that holding times (less than 14 days) may not be met by the lab due to the radl *characteristics*.

(1) Alcohols, Glycols, & Ketones - 8015 {1-Butanol, Diethyl ether, Ethylene glycol, Methanol}
(2) Semi-VOA - 8270A (TCL); Semi-VOA -- 8270A (Add-On) {2-Butoxyethanol, Tributyl phosphate}; TPH-Diesel Range - WTPH-D; TPH-Gasoline Range - WTPH-G
(3) ICP Metals - 6010A (Supertrace) {Arsenic, Barium, Cadmium, Chromium, Lead, Selenium, Silver}; ICP Metals - 6010A (Supertrace Add-On) {Antimony, Beryllium, Bismuth, Boron, Copper, Nickel}; Mercury - 7471 - (CV)
(4) IC Anions - 300.0 {Chloride, Fluoride, Nitrate, Nitrite, Phosphate, Sulfate}; Ammonia - 350.3; pH (Soil) - 9045; Total Cyanide - 9010
(5) ~~Gamma Spectroscopy {Cesium-137, Cobalt-60, Europium-152, Europium-154, Europium-155}; Gamma Spec - Add-on {Cesium-134, Radium-226, Radium-228, Tin-126}; Total Uranium; Americium-241; Isotopic Plutonium; Isotopic Uranium; Carbon-14, Iodine-129, Nickel-63, Neptunium-237~~
~~(6) Tech-99, Strontium-89, 90, Total Sr, Isotopic Thorium (Thorium-232)~~ RP 6-11-3

Matrix *: S=Soil, SE=Sediment, SO=Solid, SI=Sludge, W = Water, O=Oil, A=Air, DS=Drum Solids, DL=Drum Liquids, T=Tissue, WI=Wipe, L=Liquid, V=Vegetation, X=Other

LABORATORY SECTION	Received By	Title	Date/Time
FINAL SAMPLE DISPOSITION	Disposal Method	Disposed By	Date/Time

BHI-EE-011 (03/01/2002)

LIONVILLE LABORATORY INCORPORATED
SAMPLE RECEIPT CHECKLIST

CLIENT: TNU-HANFORD

Purchase Order/Project:

DATE: 6-13-03

CAF# / SOW# / Release #: F03-006

Laboratory SDG #: 0306L625

NOTE: ALL ENTRIES MARKED "NO" MUST BE EXPLAINED IN THE COMMENT SECTION

1.	Custody seals on coolers or shipping container intact, signed and dated?	☑ Yes	☐ No	☐ N/A	☐ see Comment #
2.	Outside of coolers or shipping containers are free from damage?	☑ Yes	☐ No	☐ N/A	☐ see Comment #
3.	Airbill # recorded?	☑ Yes	☐ No	☐ N/A	☐ see Comment #
4.	All expected paperwork received (coc and other client specific: historical data, alpha/beta or other screening data as applicable)? (paperwork sealed in plastic bag and taped to inside lid)	☑ Yes	☐ No	☐ N/A	☐ see Comment #
5.	Sample containers are intact?	☑ Yes	☐ No	☐ N/A	☐ see Comment #
6.	Custody seals on sample containers intact, signed and dated?	☑ Yes	☐ No	☐ N/A	☐ see Comment #
7.	All samples on coc received?	☑ Yes	☐ No	☐ N/A	☐ see Comment #
8.	All sample label information matches coc?	☑ Yes	☐ No	☐ N/A	☐ see Comment #
9.	Laboratory QC samples designated on coc? (QC stickers placed on bottles?)	☑ Yes	☐ No	☐ N/A	☐ see Comment #
10.	Shipment meets LvLI Sample Acceptance Policy? (identify all bottles not within policy. See reverse side for policy)	☑ Yes	☐ No	☐ N/A	☐ see Comment #
11.	Where applicable, bar code labels are affixed to coc?	☐ Yes	☐ No	☑ N/A	☐ see Comment #
12.	coc signed and dated?	☑ Yes	☐ No	☐ N/A	☐ see Comment #
13.	coc will be faxed or emailed to client?	☑ Yes	☐ No	☐ N/A	☐ see Comment #
14.	Project Manager/Client contacted concerning discrepancies? (name/date)	☐ Yes	☐ No	☑ N/A	☐ see Comment #

Cooler # / temp (°C) and Comments:

ERC 01-037 1.5

Laboratory Sample Custodian: Carl Hunt

Laboratory Project Manager:

8

Lionville Laboratory, Inc.
INORGANIC ANALYTICAL DATA PACKAGE FOR
TNUHANFORD F03-006 H2264

DATE RECEIVED: 06/13/03 LVL LOT # :0306L625

CLIENT ID /ANALYSIS	LVL #	MTX	PREP #	COLLECTION	EXTR/PREP	ANALYSIS
B161C2						
SILVER, TOTAL	001	S	03L0359	06/11/03	06/27/03	07/03/03
SILVER, TOTAL	001 REP	S	03L0359	06/11/03	06/27/03	07/03/03
SILVER, TOTAL	001 MS	S	03L0359	06/11/03	06/27/03	07/03/03
ARSENIC, TOTAL	001	S	03L0359	06/11/03	06/27/03	07/03/03
ARSENIC, TOTAL	001 REP	S	03L0359	06/11/03	06/27/03	07/03/03
ARSENIC, TOTAL	001 MS	S	03L0359	06/11/03	06/27/03	07/03/03
BORON, TOTAL	001	S	03L0359	06/11/03	06/27/03	07/03/03
BORON, TOTAL	001 REP	S	03L0359	06/11/03	06/27/03	07/03/03
BORON, TOTAL	001 MS	S	03L0359	06/11/03	06/27/03	07/03/03
BARIUM, TOTAL	001	S	03L0359	06/11/03	06/27/03	07/03/03
BARIUM, TOTAL	001 REP	S	03L0359	06/11/03	06/27/03	07/03/03
BARIUM, TOTAL	001 MS	S	03L0359	06/11/03	06/27/03	07/03/03
BERYLLIUM, TOTAL	001	S	03L0359	06/11/03	06/27/03	07/03/03
BERYLLIUM, TOTAL	001 REP	S	03L0359	06/11/03	06/27/03	07/03/03
BERYLLIUM, TOTAL	001 MS	S	03L0359	06/11/03	06/27/03	07/03/03
BISMUTH, TOTAL	001	S	03L0359	06/11/03	06/27/03	07/03/03
BISMUTH, TOTAL REP	001 REP	S	03L0359	06/11/03	06/27/03	07/03/03
BISMUTH, TOTAL SPIKE	001 MS	S	03L0359	06/11/03	06/27/03	07/03/03
CADMIUM, TOTAL	001	S	03L0359	06/11/03	06/27/03	07/03/03
CADMIUM, TOTAL	001 REP	S	03L0359	06/11/03	06/27/03	07/03/03
CADMIUM, TOTAL	001 MS	S	03L0359	06/11/03	06/27/03	07/03/03
CHROMIUM, TOTAL	001	S	03L0359	06/11/03	06/27/03	07/03/03
CHROMIUM, TOTAL	001 REP	S	03L0359	06/11/03	06/27/03	07/03/03
CHROMIUM, TOTAL	001 MS	S	03L0359	06/11/03	06/27/03	07/03/03
COPPER, TOTAL	001	S	03L0359	06/11/03	06/27/03	07/03/03
COPPER, TOTAL	001 REP	S	03L0359	06/11/03	06/27/03	07/03/03
COPPER, TOTAL	001 MS	S	03L0359	06/11/03	06/27/03	07/03/03
MERCURY, TOTAL	001	S	03C0150	06/11/03	06/19/03	06/20/03
MERCURY, TOTAL	001 REP	S	03C0150	06/11/03	06/19/03	06/20/03
MERCURY, TOTAL	001 MS	S	03C0150	06/11/03	06/19/03	06/20/03
NICKEL, TOTAL	001	S	03L0359	06/11/03	06/27/03	07/03/03
NICKEL, TOTAL	001 REP	S	03L0359	06/11/03	06/27/03	07/03/03
NICKEL, TOTAL	001 MS	S	03L0359	06/11/03	06/27/03	07/03/03
LEAD, TOTAL	001	S	03L0359	06/11/03	06/27/03	07/03/03
LEAD, TOTAL	001 REP	S	03L0359	06/11/03	06/27/03	07/03/03

Lionville Laboratory, Inc.
INORGANIC ANALYTICAL DATA PACKAGE FOR
TNUHANFORD F03-006 H2264

DATE RECEIVED: 06/13/03 LVL LOT # :0306L625

CLIENT ID /ANALYSIS	LVL #	MTX	PREP #	COLLECTION	EXTR/PREP	ANALYSIS
LEAD, TOTAL	001 MS	S	03L0359	06/11/03	06/27/03	07/03/03
ANTIMONY, TOTAL	001	S	03L0359	06/11/03	06/27/03	07/03/03
ANTIMONY, TOTAL	001 REP	S	03L0359	06/11/03	06/27/03	07/03/03
ANTIMONY, TOTAL	001 MS	S	03L0359	06/11/03	06/27/03	07/03/03
SELENIUM, TOTAL	001	S	03L0359	06/11/03	06/27/03	07/03/03
SELENIUM, TOTAL	001 REP	S	03L0359	06/11/03	06/27/03	07/03/03
SELENIUM, TOTAL	001 MS	S	03L0359	06/11/03	06/27/03	07/03/03

LAB QC:

SILVER LABORATORY	LC1 BS	S	03L0359	N/A	06/27/03	07/01/03
SILVER, TOTAL	MB1	S	03L0359	N/A	06/27/03	07/01/03
ARSENIC LABORATORY	LC1 BS	S	03L0359	N/A	06/27/03	07/01/03
ARSENIC, TOTAL	MB1	S	03L0359	N/A	06/27/03	07/01/03
BORON LABORATORY	LC1 BS	S	03L0359	N/A	06/27/03	07/01/03
BORON, TOTAL	MB1	S	03L0359	N/A		07/01/03
BARIUM LABORATORY	LC1 BS	S	03L0359	N/A	06/27/03	07/01/03
BARIUM, TOTAL	MB1	S	03L0359	N/A	06/27/03	07/01/03
BERYLLIUM LABORATORY	LC1 BS	S	03L0359	N/A	06/27/03	07/01/03
BERYLLIUM, TOTAL	MB1	S	03L0359	N/A	06/27/03	07/01/03
BISMUTH, LCS	LC1 BS	S	03L0359	N/A	06/27/03	07/01/03
BISMUTH, TOTAL	MB1	S	03L0359	N/A	06/27/03	07/01/03
CADMIUM LABORATORY	LC1 BS	S	03L0359	N/A	06/27/03	07/01/03
CADMIUM, TOTAL	MB1	S	03L0359	N/A	06/27/03	07/01/03
CHROMIUM LABORATORY	LC1 BS	S	03L0359	N/A	06/27/03	07/01/03
CHROMIUM, TOTAL	MB1	S	03L0359	N/A	06/27/03	07/01/03
COPPER LABORATORY	LC1 BS	S	03L0359	N/A	06/27/03	07/01/03
COPPER, TOTAL	MB1	S	03L0359	N/A	06/27/03	07/01/03
MERCURY LABORATORY	LC1 BS	S	03C0150	N/A	06/19/03	06/20/03
MERCURY, TOTAL	MB1	S	03C0150	N/A	06/19/03	06/20/03
NICKEL LABORATORY	LC1 BS	S	03L0359	N/A	06/27/03	07/01/03
NICKEL, TOTAL	MB1	S	03L0359	N/A	06/27/03	07/01/03
LEAD LABORATORY	LC1 BS	S	03L0359	N/A	06/27/03	07/01/03
LEAD, TOTAL	MB1	S	03L0359	N/A	06/27/03	07/01/03
ANTIMONY LABORATORY	LC1 BS	S	03L0359	N/A	06/27/03	07/01/03
ANTIMONY, TOTAL	MB1	S	03L0359	N/A	06/27/03	07/01/03
SELENIUM LABORATORY	LC1 BS	S	03L0359	N/A	06/27/03	07/01/03
SELENIUM, TOTAL	MB1	S	03L0359	N/A	06/27/03	07/01/03

LIONVILLE LABORATORY INC.

Analytical Report

Client: TNU-HANFORD F03-006
LVL#: 0306L625
SDG/SAF#: H2264/F03-006

W.O.#: 11343-606-001-9999-00
Date Received: 06-13-03

METALS CASE NARRATIVE

1. This narrative covers the analyses of 1 soil sample.

2. The samples were prepared and analyzed in accordance with methods checked on the attached glossary.

3. All analyses were performed within the required holding times.

4. All results presented in this report are derived from samples that met LvLI's sample acceptance policy.

5. All Initial and Continuing Calibration Verifications (ICV/CCVs) were within the 90-110% control limits (80-120% for Mercury).

6. All Initial and Continuing Calibration Blanks (ICB/CCBs) were within control limits (less than the PQL).

7. The preparation/method blank for 1 analyte was outside method criteria. {less than the Practical Quantitation Limit (3X the IDL), or samples greater than 20X MB value}. Refer to the Inorganics Method Blank Data Summary.

   a). The MB result for Beryllium was greater than the Practical Quantitation Limit (PQL) {3 x the (IDL) Instrument Detection Level} and all samples read less than 20 times the MB concentration. However, no corrective action criteria for MBs were provided in SW846 method 6010B. The sample results were reported herein "uncorrected" for the levels found in the MB.

8. All ICP Interference Check Standards were within control limits.

9. All laboratory control samples (LCS) were within the 80-120% control limits. Refer to the Inorganics Laboratory Control Standards Report.

10. The matrix spike (MS) recovery for 1 analyte was outside the 75-125% control limits. Refer to the Inorganics Accuracy Report.

208 Welsh Pool Road • Exton, PA 19341-1313 • (610) 280-3000 • Fax (610) 280-3041

11. For analytes where the ICP MS is out-of-control, a post-digestion MS (PDS) and serial dilution are performed. A PDS was prepared at meaningful concentration level for the following analytes:

Sample ID	Element	PDS Concentration (ppb)	PDS % Recovery
B161C2	Antimony	100	106.1

12. The duplicate analyses for 3 analytes were outside the 20% Relative Percent Difference (RPD) control limits. Refer to the Inorganics Precision Report.

13. For the purposes of this report, the data has been reported to the Instrument Detection Limit (IDL). Values between the IDL and the Practical Quantitation Limit (PQL) are acquired in a region of less-certain quantification.

14. I certify that this sample data package is in compliance with SOW requirements, both technically and for completeness, other than the conditions detailed above. Release of the data contained in this hard-copy data package has been authorized by the Laboratory Manager or a designee, as verified by the following signature.

Iain Daniels
Laboratory Manager
Lionville Laboratory Incorporated

07-11-03
Date

jjw/m06-625

METALS METHOD GLOSSARY

The following methods are used as reference for the digestion and analysis of samples contained within this Lot#: 0306L625

Leaching Procedure: __1310 __1311 __1312 __Other:_____

CLP Metals __ Digestion and __ Analysis Methods: __ILM03.0 __ILM04.0

Metals Digestion Methods: __3005A __3010A __3015 __3020A X3050B __3051 __200.7 __SS17
__Other: _____

Metals Analysis Methods

	SW846		EPA		STD MTD	EPA OSWR	USATHAMA
Aluminum	__6010B		__200.7				__99
Antimony	X6010B	__7041 [5]	__200.7	__204.2			__99
Arsenic	X6010B	__7060A [5]	__200.7	__206.2	__3113B		__99
Barium	X6010B		__200.7				__99
Beryllium	X6010B		__200.7				__99
Bismuth	X6010B [1]		__200.7 [1]			__1620	__99
Boron	X6010B		__200.7				__99
Cadmium	X6010B	__7131A [5]	__200.7	__213.2			__99
Calcium	__6010B		__200.7				__99
Chromium	X6010B	__7191 [5]	__200.7	__218.2			__SS17
Cobalt	__6010B		__200.7				__99
Copper	X6010B	__7211 [5]	__200.7	__220.2			__99
Iron	__6010B		__200.7				__99
Lead	X6010B	__7421 [5]	__200.7	__239.2	__3113B		__99
Lithium	__6010B	__7430 [4]	__200.7			__1620	__99
Magnesium	__6010B		__200.7				__99
Manganese	__6010B		__200.7				__99
Mercury	__7470A [3]	X7471A [3]	__245.1 [2]	__245.5 [2]			__99
Molybdenum	__6010B		__200.7				__99
Nickel	X6010B		__200.7				__99
Potassium	__6010B	__7610 [4]	__200.7	__258.1 [4]			__99
Rare Earths	__6010B [1]		__200.7 [1]			__1620	__99
Selenium	X6010B	__7740 [5]	__200.7	__270.2	__3113B		__99
Silicon	__6010B [1]		__200.7			__1620	__99
Silica	__6010B		__200.7			__1620	__99
Silver	X6010B	__7761 [5]	__200.7	__272.2			__99
Sodium	__6010B	__7770 [4]	__200.7	__273.1 [4]			__99
Strontium	__6010B		__200.7				__99
Thallium	__6010B	__7841 [5]	__200.7	__279.2	__200.9		__99
Tin	__6010B		__200.7				__99
Titanium	__6010B		__200.7				__99
Uranium	__6010B [1]		__200.7 [1]			__1620	__99
Vanadium	__6010B		__200.7				__99
Zinc	__6010B		__200.7				__99
Zirconium	__6010B [1]		__200.7 [1]			__1620	__99

Other:_____ **Method:**_____

METHOD REFERENCES AND DATA QUALIFIERS

DATA QUALIFIERS

U = Indicates that the parameter was not detected at or above the reported limit. The associated numerical value is the sample detection limit.

* = Indicates that the original sample result is greater than 4x the spike amount added.

ABBREVIATIONS

MB = Method or Preparation Blank.
MS = Matrix Spike.
MSD = Matrix Spike Duplicate.
REP = Sample Replicate
LCS = Laboratory Control Sample.
NC = Not calculated.

ANALYTICAL METAL METHODS

1. Not included in the method element list.

2. Modified Hg: Hg1 and Hg2 require less total volume of digestate due to the autosampler analysis. Sample volumes and reagents for mercury determinations in water and soil have been proportionately scaled down to adapt to this semi-automated technique. The sample volume used for water analysis is 33 mL. For soils, approximately 0.3 grams of sample is taken to a final volume of 50 mL (including all reagents).

3. Flame AA.

4. Graphite Furnace AA.

Lionville Laboratory, Inc.

INORGANICS DATA SUMMARY REPORT 07/10/03

CLIENT: TNUHANPORD F03-006 H2264 LVL LOT #: 0306L625

WORK ORDER: 11343-606-001-9999-00

SAMPLE	SITE ID	ANALYTE	RESULT	UNITS	REPORTING LIMIT	DILUTION FACTOR
-001	B161C2	Silver, Total	0.11 u	MG/KG	0.11	1.0
		Arsenic, Total	2.3	MG/KG	0.30	1.0
		Boron, Total	1.0	MG/KG	0.17	1.0
		Barium, Total	52.3	MG/KG	0.02	1.0
		Beryllium, Total	0.12	MG/KG	0.009	1.0
		Bismuth, Total	0.47 u	MG/KG	0.47	1.0
		Cadmium, Total	0.04 u	MG/KG	0.04	1.0
		Chromium, Total	11.2	MG/KG	0.09	1.0
		Copper, Total	13.0	MG/KG	0.06	1.0
		Mercury, Total	0.02 u	MG/KG	0.02	1.0
		Nickel, Total	11.2	MG/KG	0.12	1.0
		Lead, Total	2.8	MG/KG	0.21	1.0
		Antimony, Total	0.22	MG/KG	0.20	1.0
		Selenium, Total	0.39 u	MG/KG	0.39	1.0

Lionville Laboratory, Inc.

INORGANICS METHOD BLANK DATA SUMMARY PAGE 07/10/03

CLIENT: TNUHANFORD F03-006 H2264 LVL LOT #: 0306L625

WORK ORDER: 11343-606-001-9999-00

SAMPLE	SITE ID	ANALYTE	RESULT	UNITS	REPORTING LIMIT	DILUTION FACTOR
BLANK1	03L0359-MB1	Silver, Total	0.12 u	MG/KG	0.12	1.0
		Arsenic, Total	0.33 u	MG/KG	0.33	1.0
		Boron, Total	0.26	MG/KG	0.19	1.0
		Barium, Total	0.03	MG/KG	0.02	1.0
		Beryllium, Total	0.03	MG/KG	0.01	1.0
		Bismuth, Total	0.51 u	MG/KG	0.51	1.0
		Cadmium, Total	0.04 u	MG/KG	0.04	1.0
		Chromium, Total	0.10 u	MG/KG	0.10	1.0
		Copper, Total	0.06 u	MG/KG	0.06	1.0
		Nickel, Total	0.13 u	MG/KG	0.13	1.0
		Lead, Total	0.23 u	MG/KG	0.23	1.0
		Antimony, Total	0.22 u	MG/KG	0.22	1.0
		Selenium, Total	0.42 u	MG/KG	0.42	1.0
BLANK1	03C0150-MB1	Mercury, Total	0.02 u	MG/KG	0.02	1.0

Lionville Laboratory, Inc.

INORGANICS ACCURACY REPORT 07/10/03

CLIENT: TNUHANFORD F03-006 H2264 LVL LOT #: 0306L625

WORK ORDER: 11343-606-001-9999-00

SAMPLE	SITE ID	ANALYTE	SPIKED SAMPLE	INITIAL RESULT	SPIKED AMOUNT	%RECOV	DILUTION FACTOR(SPK)
-001	B161C2	Silver, Total	4.5	0.11u	4.8	93.8	1.0
		Arsenic, Total	180	2.3	191	93.1	1.0
		Boron, Total	89.4	1.0	95.5	92.6	1.0
		Barium, Total	236	52.3	191	96.1	1.0
		Beryllium, Total	4.8	0.12	4.8	97.6	1.0
		Bismuth, Total	454	0.47u	478	95.0	1.0
		Cadmium, Total	4.6	0.04u	4.8	95.8	1.0
		Chromium, Total	29.0	11.2	19.1	93.2	1.0
		Copper, Total	34.5	13.0	23.9	90.0	1.0
		Mercury, Total	0.15	0.02u	0.15	101.3	1.0
		Nickel, Total	55.8	11.2	47.7	93.5	1.0
		Lead, Total	48.2	2.8	47.7	95.2	1.0
		Antimony, Total	26.6	0.22	47.7	55.3	1.0
		Selenium, Total	173	0.39u	191	90.6	1.0

Lionville Laboratory, Inc.

INORGANICS PRECISION REPORT 07/10/03

CLIENT: TNUHANFORD F03-006 H2264 LVL LOT #: 0306L625

WORK ORDER: 11343-606-001-9999-00

SAMPLE	SITE ID	ANALYTE	INITIAL RESULT	REPLICATE	RPD	DILUTION FACTOR(REP)
-001REP	B161C2	Silver, Total	0.11u	0.12u	NC	1.0
		Arsenic, Total	2.3	1.9	19.0	1.0
		Boron, Total	1.0	0.74	29.8	1.0
		Barium, Total	52.3	53.7	2.6	1.0
		Beryllium, Total	0.12	0.16	29.6	1.0
		Bismuth, Total	0.47u	0.50u	NC	1.0
		Cadmium, Total	0.04u	0.04u	NC	1.0
		Chromium, Total	11.2	9.7	14.4	1.0
		Copper, Total	13.0	10.9	17.6	1.0
		Mercury, Total	0.02u	0.02u	NC	1.0
		Nickel, Total	11.2	12.1	7.7	1.0
		Lead, Total	2.8	2.7	3.6	1.0
		Antimony, Total	0.22	0.22u	NC 200	1.0
		Selenium, Total	0.39u	0.41u	NC 7/10/03	1.0

Lionville Laboratory, Inc.

INORGANICS LABORATORY CONTROL STANDARDS REPORT 07/10/03

CLIENT: TNUHANFORD F03-006 H2264 LVL LOT #: 0306L625

WORK ORDER: 11343-606-001-9999-00

SAMPLE	SITE ID	ANALYTE	SPIKED SAMPLE	SPIKED AMOUNT	UNITS	%RECOV
LCS1	03L0359-LC1	Silver, LCS	48.2	50.0	MG/KG	96.4
		Arsenic, LCS	931	1000	MG/KG	93.1
		Boron, LCS	475	500	MG/KG	94.9
		Barium, LCS	513	500	MG/KG	102.6
		Beryllium, LCS	24.1	25.0	MG/KG	96.4
		Bismuth, LCS	492	500	MG/KG	98.5
		Cadmium, LCS	24.6	25.0	MG/KG	98.4
		Chromium, LCS	49.9	50.0	MG/KG	99.8
		Copper, LCS	126	125	MG/KG	100.9
		Nickel, LCS	204	200	MG/KG	102.2
		Lead, LCS	246	250	MG/KG	98.3
		Antimony, LCS	289	300	MG/KG	96.2
		Selenium, LCS	863	1000	MG/KG	86.3
LCS1	03C0150-LC1	Mercury, LCS	6.4	6.2	MG/KG	102.8

Lionville Laboratory Use Only
0306L625

Custody Transfer Record/Lab Work Request

Page 1 of 1

LvLI LIONVILLE LABORATORY INC

FIELD PERSONNEL: COMPLETE ONLY SHADED AREAS

Client TNU-HANFORD F03-006
Est. Final Proj. Sampling Date
Project # 11343-606-001-9999-00
Project Contact/Phone #
Lionville Laboratory Project Manager OJ
QC SPEC Del STD TAT 30 days
Date Rec'd 6-13-03 Date Due 7-17-03

		A				B			C		D	E
Refrigerator #		2	1								1	2
#/Type Container	Liquid											
	Solid	1AG				1AG			1AG		1AG	1AG
Volume	Liquid											
	Solid	125				60			60		125	60
Preservatives												
ANALYSES REQUESTED		ORGANIC: VOA	BNA	Pest/PCB	Herb	Alcohols/glycols/ketones		INORG: TCLP Metal	CN		I.C Anions	NO2 NO3

MATRIX CODES:
S - Soil
SE - Sediment
SO - Solid
SL - Sludge
W - Water
O - Oil
A - Air
DS - Drum Solids
DL - Drum Liquids
L - EP/TCLP Leachate
WI - Wipe
X - Other
F - Fish

Lab ID	Client ID/Description	Matrix QC Chosen (✓) MS	MSD	Matrix	Date Collected	Time Collected	OG25X ODRO OGRO			OGCSC		MET0		INORG0	ININ2 I0GGR ICR6
001	B161C2	✓	✓	S	6-11-03	0925	1			1		1		1	1

Lionville Laboratory Use Only

Special Instructions: SAF # F03-006

MET0: RCRA + Sb, Be, Bi, B, Cu, Ni

INORG0: IC: Cl, F, NO3, NO2, PO4, SO4
INNH3N, IPH, ICNTO

DATE/REVISIONS:
1.
2.
3.
4.
5.
6.

Relinquished by	Received by	Date	Time	Relinquished by	Received by	Date	Time
Fenk	[signature]	6-13-03	0910				

COMPOSITE WASTE

ORIGINAL REWRITTEN

Discrepancies Between Samples Labels and COC Record? Y or (N)
NOTES:

Lionville Laboratory Use Only

Samples were:
1) Shipped ✓ or Hand Delivered
Airbill # See below
2) Ambient or (Chilled)
3) Received in Good Condition (Y) or N
4) Samples Properly Preserved (Y) or N
5) Received Within Holding Times (Y) or N

Tamper Resistant Seal was:
1) Present on Outer Package (Y) or N
2) Unbroken on Outer Package (Y) or N
3) Present on Sample (Y) or N
4) Unbroken on Sample (Y) or N
COC Record Present Upon Sample Rec't (Y) or N
Cooler Temp. 1.5 °C

FH-Central Plateau Project	CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST	F03-006-189	Page 1 of 1

Collector ~~Johansen~~/Pope/Pfister/Hughes (rp 6-11-3)	Company Contact: LC Hulstrom; Telephone No.: 373-3928	Project Coordinator: TRENT, SJ	Price Code: 8N; Data Turnaround: 45 Days
Project Designation: 200-PW-2/200-PW-4 OU - Borehole Soil Sampling	Sampling Location: 216-B-12 (C3246); 197.5-200	SAF No.: F03-006	Air Quality ☐
Ice Chest No.: ERC 01-037	Field Logbook No.: HNF-N-3361; COA: 117504ES10	Method of Shipment: Federal Express	
Shipped To: ~~EBERLINE SERVICES (Formerly TMA)~~ Paragon (TM 6-9-03)	Offsite Property No.: A030286	Bill of Lading/Air Bill No.: SEE OSPC	

POSSIBLE SAMPLE HAZARDS/REMARKS
RADIOACTIVE TIE TO: B171P5

Special Handling and/or Storage
Cool 4C

Preservation	Cool 4C	Cool 4C	None	Cool 4C	Cool 4C	None	None	None		
Type of Container	aG	aG	aG	aG	aG	aG	aG	aG		
No. of Container(s)	1	1	1	1	1	1	1	1		
Volume	60mL	125mL	60mL	125mL	60mL	60mL	60mL	60mL		
SAMPLE ANALYSIS	See item (1) in Special Instructions.	See item (2) in Special Instructions.	See item (3) in Special Instructions.	See item (4) in Special Instructions.	NO2/NO3 - 353.2; Oil & Grease - 413.1; Chromium Hex - 7196	See item (5) in Special Instructions.	See item (6) in Special Instructions.	Tritium - H3		

Sample No.	Matrix *	Sample Date	Sample Time										
B161C2	SOIL	6-11-3	0925	X	X	X	X	X					

(Columns 6–8 lined out, rp 6-11-3)

CHAIN OF POSSESSION	Date/Time	Received By/Stored In	Date/Time
Relinquished By/Removed From: R. PFISTER	6/11/3 1417	[signature]	6/11/03 1417
Relinquished By/Removed From: [signature]	6/11/03 1417	Received By/Stored In: R. Fahlberg	6·11·03 1417
Relinquished By/Removed From: R. Fahlberg	6·11·03 1417	Received By/Stored In: 1B 3728	6·11·03 1417
Relinquished By/Removed From: 1B 3728	6·12·03 1200	Received By/Stored In: R. Fahlberg	6·12·03 1200
Relinquished By/Removed From ERC: R. Fahlberg	6·12·03 1200	Received By/Stored In: Fed Ex	
Relinquished By/Removed From: FedEx	6-13-03 0910	Received By/Stored In: [signature]	6-13-03 0910

SPECIAL INSTRUCTIONS
~~The lab is to achieve a detection limit of 50.0 pCi/g for C-14.~~ (rp 6-11-3) Report kerosene and diesel range compounds from WTPH-D analysis. FH acknowledges that holding times (less than 14 days) may not be met by the lab due to the radl characteristics.

(1) Alcohols, Glycols, & Ketones - 8015 {1-Butanol, Diethyl ether, Ethylene glycol, Methanol}
(2) Semi-VOA - 8270A (TCL); Semi-VOA – 8270A (Add-On) {2-Butoxyethanol, Tributyl phosphate}; TPH-Diesel Range - WTPH-D; TPH-Gasoline Range - WTPH-G
(3) ICP Metals - 6010A (Supertrace) {Arsenic, Barium, Cadmium, Chromium, Lead, Selenium, Silver}; ICP Metals - 6010A (Supertrace Add-On) {Antimony, Beryllium, Bismuth, Boron, Copper, Nickel}; Mercury - 7471 - (CV)
(4) IC Anions - 300.0 {Chloride, Fluoride, Nitrate, Nitrite, Phosphate, Sulfate}; Ammonia - 350.3; pH (Soil) - 9045; Total Cyanide - 9010
~~(5) Gamma Spectroscopy {Cesium-137, Cobalt-60, Europium-152, Europium-154, Europium-155}; Gamma Spec - Add-on {Cesium-134, Radium-226, Radium-228, Th-126}; Total Uranium; Americium-241, Isotopic Plutonium, Isotopic Uranium; Carbon-14, Iodine-129, Nickel-63, Neptunium-237~~ (rp 6-11-3)
~~(6) Tech-99, Strontium-89,90, Total Sr, Isotopic Thorium {Thorium-232}~~

Matrix *
S=Soil
SE=Sediment
SO=Solid
SI=Sludge
W = Water
O=Oil
A=Air
DS=Drum Solids
DL=Drum Liquids
T=Tissue
WI=Wipe
L=Liquid
V=Vegetation
X=Other

LABORATORY SECTION	Received By	Title	Date/Time
FINAL SAMPLE DISPOSITION	Disposal Method	Disposed By	Date/Time

LIONVILLE LABORATORY INCORPORATED
SAMPLE RECEIPT CHECKLIST

ENT: TNU-HANFORD

:hase Order/Project:

DATE: 6-13-03

:# / SOW# / Release #: F03-006

oratory SDG #: 0306L625

TE: ALL ENTRIES MARKED "NO" MUST BE EXPLAINED IN THE COMMENT SECTION

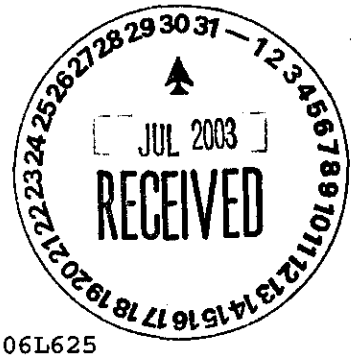
1. Custody seals on coolers or shipping container intact, signed and dated?	☑ Yes	☐ No	☐ N/A	☐ see Comment #
2. Outside of coolers or shipping containers are free from damage?	☑ Yes	☐ No	☐ N/A	☐ see Comment #
3. Airbill # recorded?	☑ Yes	☐ No	☐ N/A	☐ see Comment #
4. All expected paperwork received (coc and other client specific: historical data, alpha/beta or other screening data as applicable)? (paperwork sealed in plastic bag and taped to inside lid)	☑ Yes	☐ No	☐ N/A	☐ see Comment #
5. Sample containers are intact?	☑ Yes	☐ No	☐ N/A	☐ see Comment #
6. Custody seals on sample containers intact, signed and dated?	☑ Yes	☐ No	☐ N/A	☐ see Comment #
7. All samples on coc received?	☑ Yes	☐ No	☐ N/A	☐ see Comment #
8. All sample label information matches coc?	☑ Yes	☐ No	☐ N/A	☐ see Comment #
9. Laboratory QC samples designated on coc? (QC stickers placed on bottles?)	☑ Yes	☐ No	☐ N/A	☐ see Comment #
10. Shipment meets LvL1 Sample Acceptance Policy? (identify all bottles not within policy. See reverse side for policy)	☑ Yes	☐ No	☐ N/A	☐ see Comment #
11. Where applicable, bar code labels are affixed to coc?	☐ Yes	☐ No	☑ N/A	☐ see Comment #
12. coc signed and dated?	☑ Yes	☐ No	☐ N/A	☐ see Comment #
13. coc will be faxed or emailed to client?	☑ Yes	☐ No	☐ N/A	☐ see Comment #
14. Project Manager/Client contacted concerning discrepancies? (name/date)	☐ Yes	☐ No	☑ N/A	☐ see Comment #

Cooler # / temp (°C) and Comments:

ERC 01-037 1.5

Laboratory Sample Custodian: Carla Hunt

Laboratory Project Manager:



Lionville Laboratory, Inc.
INORGANIC ANALYTICAL DATA PACKAGE FOR
TNUHANFORD F03-006 H2264

DATE RECEIVED: 06/13/03 LVL LOT # :0306L625

CLIENT ID /ANALYSIS	LVL #	MTX	PREP #	COLLECTION	EXTR/PREP	ANALYSIS
B161C2						
% SOLIDS	001	S	03L%S082	06/11/03	06/19/03	06/20/03
% SOLIDS	001 REP	S	03L%S082	06/11/03	06/19/03	06/20/03
CHLORIDE BY IC	001	S	03LICA39	06/11/03	06/19/03	06/19/03
CHLORIDE BY IC	001 REP	S	03LICA39	06/11/03	06/19/03	06/19/03
CHLORIDE BY IC	001 MS	S	03LICA39	06/11/03	06/19/03	06/19/03
FLUORIDE BY IC	001	S	03LICA39	06/11/03	06/19/03	06/19/03
FLUORIDE BY IC	001 REP	S	03LICA39	06/11/03	06/19/03	06/19/03
FLUORIDE BY IC	001 MS	S	03LICA39	06/11/03	06/19/03	06/19/03
NITRITE BY IC	001	S	03LICA39	06/11/03	06/19/03	06/19/03
NITRITE BY IC	001 REP	S	03LICA39	06/11/03	06/19/03	06/19/03
NITRITE BY IC	001 MS	S	03LICA39	06/11/03	06/19/03	06/19/03
NITRATE BY IC	001	S	03LICA39	06/11/03	06/19/03	06/19/03
NITRATE BY IC	001 REP	S	03LICA39	06/11/03	06/19/03	06/19/03
NITRATE BY IC	001 MS	S	03LICA39	06/11/03	06/19/03	06/19/03
TOTAL CYANIDE	001	S	03LC058	06/11/03	06/20/03	06/20/03
TOTAL CYANIDE	001 REP	S	03LC058	06/11/03	06/20/03	06/20/03
TOTAL CYANIDE	001 MS	S	03LC058	06/11/03	06/20/03	06/20/03
PHOSPHATE BY IC	001	S	03LICA39	06/11/03	06/19/03	06/19/03
PHOSPHATE BY IC	001 REP	S	03LICA39	06/11/03	06/19/03	06/19/03
PHOSPHATE BY IC	001 MS	S	03LICA39	06/11/03	06/19/03	06/19/03
CHROMIUM VI	001	S	03LVI052	06/11/03	06/27/03	06/27/03
CHROMIUM VI	001 REP	S	03LVI052	06/11/03	06/27/03	06/27/03
CHROMIUM VI	001 MS	S	03LVI052	06/11/03	06/27/03	06/27/03
CHROMIUM VI	001 MSD	S	03LVI052	06/11/03	06/27/03	06/27/03
SULFATE BY IC	001	S	03LICA39	06/11/03	06/19/03	06/19/03
SULFATE BY IC	001 REP	S	03LICA39	06/11/03	06/19/03	06/19/03
SULFATE BY IC	001 MS	S	03LICA39	06/11/03	06/19/03	06/19/03
NITRATE NITRITE	001	S	03LN3B31	06/11/03	06/24/03	06/24/03
NITRATE NITRITE	001 REP	S	03LN3B31	06/11/03	06/24/03	06/24/03
NITRATE NITRITE	001 MS	S	03LN3B31	06/11/03	06/24/03	06/24/03
AMMONIA	001	S	03LAMA16	06/11/03	06/30/03	06/30/03
AMMONIA	001 REP	S	03LAMA16	06/11/03	06/30/03	06/30/03
AMMONIA	001 MS	S	03LAMA16	06/11/03	06/30/03	06/30/03
OIL & GREASE BY GRAV	001	S	03LOG028	06/11/03	06/24/03	06/26/03
OIL AND GREASE BY GR	001 REP	S	03LOG028	06/11/03	06/24/03	06/26/03

Lionville Laboratory, Inc.
INORGANIC ANALYTICAL DATA PACKAGE FOR
TNUHANFORD F03-006 H2264

DATE RECEIVED: 06/13/03 LVL LOT # :0306L625

CLIENT ID /ANALYSIS	LVL #	MTX	PREP #	COLLECTION	EXTR/PREP	ANALYSIS
OIL AND GREASE BY GR	001 MS	S	03LOG028	06/11/03	06/24/03	06/26/03
PH	001	S	03LPH040	06/11/03	06/16/03	06/16/03
PH	001 REP	S	03LPH040	06/11/03	06/16/03	06/16/03

LAB QC:

CHLORIDE BY IC	MB1	S	03LICA39	N/A	06/19/03	06/19/03
CHLORIDE BY IC	MB1 BS	S	03LICA39	N/A	06/19/03	06/19/03
FLUORIDE BY IC	MB1	S	03LICA39	N/A	06/19/03	06/19/03
FLUORIDE BY IC	MB1 BS	S	03LICA39	N/A	06/19/03	06/19/03
NITRITE BY IC	MB1	S	03LICA39	N/A	06/19/03	06/19/03
NITRITE BY IC	MB1 BS	S	03LICA39	N/A	06/19/03	06/19/03
NITRATE BY IC	MB1	S	03LICA39	N/A	06/19/03	06/19/03
NITRATE BY IC	MB1 BS	S	03LICA39	N/A	06/19/03	06/19/03
TOTAL CYANIDE	LCS L	S	03LC058	N/A	06/20/03	06/20/03
TOTAL CYANIDE	LCS L	S	03LC058	N/A	06/20/03	06/20/03
TOTAL CYANIDE	MB1	S	03LC058	N/A	06/20/03	06/20/03
PHOSPHATE BY IC	MB1	S	03LICA39	N/A	06/19/03	06/19/03
PHOSPHATE BY IC	MB1 BS	S	03LICA39	N/A	06/19/03	06/19/03
CHROMIUM VI	MB1	S	03LVI052	N/A	06/27/03	06/27/03
CHROMIUM VI	MB1 BS	S	03LVI052	N/A	06/27/03	06/27/03
CHROMIUM VI	MB1 BSD	S	03LVI052	N/A	06/27/03	06/27/03
SULFATE BY IC	MB1	S	03LICA39	N/A	06/19/03	06/19/03
SULFATE BY IC	MB1 BS	S	03LICA39	N/A	06/19/03	06/19/03
NITRATE NITRITE	MB1	S	03LN3B31	N/A	06/24/03	06/24/03
NITRATE NITRITE	MB1 BS	S	03LN3B31	N/A	06/24/03	06/24/03
AMMONIA	MB1	S	03LAMA16	N/A	06/30/03	06/30/03
AMMONIA	MB1 BS	S	03LAMA16	N/A	06/30/03	06/30/03
AMMONIA	MB1 BSD	S	03LAMA16	N/A	06/30/03	06/30/03
OIL & GREASE BY GRAV	MB1	S	03LOG028	N/A	06/24/03	06/26/03
OIL AND GREASE BY GR	MB1 BS	S	03LOG028	N/A	06/24/03	06/26/03
OIL AND GREASE BY GR	MB1 BSD	S	03LOG028	N/A	06/24/03	06/26/03

LIONVILLE LABORATORY INC.

Analytical Report

Client: TNU-HANFORD F03-006 H2264
LVL#: 0306L625

W.O.#: 11343-606-001-9999-00
Date Received: 06-13-03

INORGANIC NARRATIVE

1. This narrative covers the analyses of 1 soil sample.

2. The sample was prepared and analyzed in accordance with the methods indicated on the attached glossary.

3. The sample holding times as required by the method and/or contract were met.

4. The results presented in this report are derived from samples that met LvLI's sample acceptance policy.

5. The method blanks were within the method criteria.

6. The Laboratory Control Samples (LCS) were within the laboratory control limits. The duplicate LCS for Ammonia and Oil and Grease were within the 20% Relative Percent Difference (RPD) control limit.

7. The matrix spike recoveries for Chloride, Fluoride, Nitrite, Nitrate, Total Cyanide, Phosphate, Chromium VI, Sulfate, Nitrate Nitrite, Ammonia and Oil and Grease were within the 75-125% control limits.

8. The replicate analyses for Percent Solids, Chloride, Fluoride, Nitrite, Nitrate, Total Cyanide, Phosphate, Chromium VI, Sulfate, Nitrate Nitrite, Ammonia, Oil and Grease and pH were within the 20% RPD control limit.

9. Results for solid samples are reported on a dry weight basis.

10. I certify that this sample data package is in compliance with SOW requirements, both technically and for completeness, other than the conditions detailed above. Release of the data contained in this hard copy package has been authorized by the Laboratory Manager or a designee, as verified by the following signature.

Iain Daniels
Laboratory Manager
Lionville Laboratory Incorporated

07-11-03
Date

njp\i06-625

208 Welsh Pool Road • Exton, PA 19341-1313 • (610) 280-3000 • Fax (610) 280-3041

Lionville Laboratory Incorporated

WET CHEMISTRY

METHODS GLOSSARY FOR SOIL/SOLIDS SAMPLE ANALYSIS

	ASTM	SW846	OTHER
% Ash	__ D2216-80		
% Moisture	__ D2216-80		__ ILMO4.0 (e)
% Solids	√ D2216-80		__ ILMO4.0 (e)
% Volatile Solids	__ D2216-80		
ASTM Extraction in Water	__ D3987-81/85		
BTU	__ D240-87		
CEC		__ 9081	__ c
Chromium VI		√ 3060A/7196A	
Corrosivity __ by coupon __ by pH		__ 1110(mod) __ 9045C	
Cyanide, Total		√ 9010B/9014	__ ILMO4.0 (e)
Cyanide, Reactive		__ Section 7.3/9014	
Halides, Extractable Organic		__ 9020B	__ EPA 600/4/84-008
Halides, Total		__ 9020B	__ EPA 600/4/84-008
EP Toxicity		__ 1310A	
Flash Point		__ 1010	
Ignitability		__ 1010	
Oil & Grease		√ 9071A	√ 413.1 (mod.)
Carbon, Total Organic		__ 9060	__ Lloyd Kahn (mod)
Oxygen Bomb Prep for Anions	__ D240-87(mod)	__ 5050	
Petroleum Hydrocarbons, Total Recoverable		__ 9071	__ EPA 418.1
pH, Soil		√ 9045C	
Sulfide, Reactive		__ Section 7.3/9030B	
Sulfide		__ 9030B(mod)	
Specific Gravity	__ D1429-76C/	__ D5057-90	
Sulfur, Total		__ 9056	
Synthetic Preparation Leach		__ 1312	
Paint Filter		__ 9095A	

Other: Chloride, Fluoride, Nitrite, **Method:** EPA 300.0 (mod.)

Other: Nitrate, Phosphate, Sulfate **Method**

Nitrate Nitrite EPA 353.2 (mod.)

Ammonia EPA 350.3

Lionville Laboratory Incorporated

METHOD REFERENCES AND DATA QUALIFIERS

DATA QUALIFIERS

U = Indicates that the parameter was not detected at or above the reported limit. The associated numerical value is the sample detection limit.

* = Indicates that the original sample result is greater than 4x the spike amount added.

ABBREVIATIONS

MB = Method or Preparation Blank.
MS = Matrix Spike.
MSD = Matrix Spike Duplicate.
REP = Sample Replicate
LC = Laboratory Control Sample.
NC = Not calculated.

A suffix of -R, -S, or -T following these codes indicate a replicate, spike or sample duplicate analysis respectively.

ANALYTICAL WET CHEMISTRY METHODS

1. ASTM Standard Methods.

2. USEPA Methods for Chemical Analysis of Water and Wastes (USEPA 600/4-79-020).

3. Test Methods for Evaluating Solid Waste (USEPA SW-846).

a. Standard Methods for the Examination of Water and Waste, 16 ed, (1983).

b. Standard Methods for the Examination of Water and Waste, 17 ed, (1989)/18ed (1992).

c. Method of Soil Analysis, Part 1, Physical and Mineralogical Methods, 2nd ed, (1986).

d. Method of Soil Analysis, Part 2, Chemical and Microbiological Properties, Am. Soc. Agron., Madison, WI (1965).

e. USEPA Contract Laboratory Program, Statement of Work for Inorganic Analysis.

f. Code of Federal Regulations.

Lionville Laboratory, Inc.

INORGANICS DATA SUMMARY REPORT 07/03/03

CLIENT: TNUHANFORD F03-006 H2264 LVL LOT #: 0306L625

WORK ORDER: 11343-606-001-9999-00

SAMPLE	SITE ID	ANALYTE	RESULT		UNITS	REPORTING LIMIT	DILUTION FACTOR
-001	B161C2	% Solids	97.9		%	0.01	1.0
		Chloride by IC	1.3	u	MG/KG	1.3	1.0
		Fluoride by IC	1.3	u	MG/KG	1.3	1.0
		Nitrite by IC	1.28	u	MG/KG	1.28	1.0
		Nitrate by IC	62.0		MG/KG	6.38	5.0
		Cyanide, Total	0.34	u	MG/KG	0.34	1.0
		Phosphate by IC	1.3	u	MG/KG	1.3	1.0
		Chromium VI	0.41	u	MG/KG	0.41	1.0
		Sulfate by IC	6.8		MG/KG	1.3	1.0
		Nitrate Nitrite	15.4		MG/KG	0.85	5.0
		Ammonia, as N	4.8	u	MG/KG	4.8	1.0
		Oil & Grease Gravimetri	681	u	MG/KG	681	1.0
		pH	8.7		SOIL PH	0.01	1.0

Lionville Laboratory, Inc.

INORGANICS METHOD BLANK DATA SUMMARY PAGE 07/03/03

CLIENT: TNUHANFORD F03-006 H2264 LVL LOT #: 0306L625

WORK ORDER: 11343-606-001-9999-00

SAMPLE	SITE ID	ANALYTE	RESULT		UNITS	REPORTING LIMIT	DILUTION FACTOR
BLANK10	03LICA39-MB1	Chloride by IC	1.2	u	MG/KG	1.2	1.0
		Fluoride by IC	1.2	u	MG/KG	1.2	1.0
		Nitrite by IC	1.25	u	MG/KG	1.25	1.0
		Nitrate by IC	1.25	u	MG/KG	1.25	1.0
		Phosphate by IC	1.2	u	MG/KG	1.2	1.0
		Sulfate by IC	1.2	u	MG/KG	1.2	1.0
BLANK1	03LC058-MB1	Cyanide, Total	0.50	u	MG/KG	0.50	1.0
BLANK10	03LVI052-MB1	Chromium VI	0.40	u	MG/KG	0.40	1.0
BLANK10	03LN3B31-MB1	Nitrate Nitrite	0.20	u	MG/KG	0.20	1.0
BLANK10	03LAMA16-MB1	Ammonia, as N	5.0	u	MG/KG	5.0	1.0
BLANK10	03LOG028-MB1	Oil & Grease Gravimetri	667	u	MG/KG	667	1.0

Lionville Laboratory, Inc.

INORGANICS ACCURACY REPORT 07/03/03

CLIENT: TNUHANFORD F03-006 H2264 LVL LOT #: 0306L625

WORK ORDER: 11343-606-001-9999-00

SAMPLE	SITE ID	ANALYTE	SPIKED SAMPLE	INITIAL RESULT	SPIKED AMOUNT	%RECOV	DILUTION FACTOR(SPK)
-001	B161C2	Chloride by IC	25.8	0.59	25.5	98.6	1.0
		Fluoride by IC	25.4	0.32	25.5	98.1	1.0
		Nitrite by IC	24.9	1.28u	25.5	97.3	1.0
		Nitrate by IC	195	62.0	128	103.8	5.0
		Cyanide, Total	2.81	0.34u	2.93	95.8	1.0
		Phosphate by IC	24.1	1.3 u	25.5	94.2	1.0
		Soluble Chromium VI	3.7	0.41u	4.1	88.0	1.0
		Insoluble Chromium VI	1110	0.41u	1140	97.7	100
		Sulfate by IC	33.2	6.8	25.5	103.3	1.0
		Nitrate Nitrite	18.7	15.4	4.4	76.4	5.0
		Ammonia, as N	170	4.8 u	178	95.3	1.0
		Oil & Grease Gravimetr	7750	681 u	7750	100	1.0
BLANK10	03LICA39-MB1	Chloride by IC	23.9	1.2 u	25.0	95.8	1.0
		Fluoride by IC	24.2	1.2 u	25.0	97.0	1.0
		Nitrite by IC	23.5	1.25u	25.0	93.9	1.0
		Nitrate by IC	24.1	1.25u	25.0	96.4	1.0
		Phosphate by IC	24.4	1.2 u	25.0	97.4	1.0
		Sulfate by IC	24.4	1.2 u	25.0	97.8	1.0
BLANK10	03LVI052-MB1	Soluble Chromium VI	4.0	0.40u	4.0	99.3	1.0
		Insoluble Chromium VI	1240	0.40u	1240	99.5	100
BLANK10	03LN3B31-MB1	Nitrate Nitrite	5.0	0.20u	5.0	100.4	1.0
BLANK10	03LAMA16-MB1	Ammonia, as N	180	5.0 u	200	90.0	1.0
		Ammonia, as N MSD	186	5.0 u	200	93.0	1.0
BLANK10	03LOG028-MB1	Oil & Grease Gravimetr	7450	667 u	7590	98.2	1.0
		Oil & Grease - Grav M	7520	667 u	7590	99.1	1.0

Lionville Laboratory, Inc.

INORGANICS DUPLICATE SPIKE REPORT 07/03/03

CLIENT: TNUHANFORD F03-006 H2264 LVL LOT #: 0306L625

WORK ORDER: 11343-606-001-9999-00

SAMPLE	SITE ID	ANALYTE	SPIKE#1 %RECOV	SPIKE#2 %RECOV	%DIFF
BLANK10	03LAMA16-MB1	Ammonia, as N	90.0	93.0	3.3
BLANK10	03LOG028-MB1	Oil & Grease - Grav	98.2	99.1	0.89

Lionville Laboratory, Inc.

INORGANICS PRECISION REPORT 07/03/03

CLIENT: TNUHANFORD F03-006 H2264 LVL LOT #: 0306L625

WORK ORDER: 11343-606-001-9999-00

SAMPLE	SITE ID	ANALYTE	INITIAL RESULT	REPLICATE	RPD	DILUTION FACTOR(REP)
-001REP	B161C2	% Solids	97.9	97.7	0.16	1.0
		Chloride by IC	1.3 u	1.3 u	NC	1.0
		Fluoride by IC	1.3 u	1.3 u	NC	1.0
		Nitrite by IC	1.28u	1.28u	NC	1.0
		Nitrate by IC	62.0	64.1	3.4	5.0
		Cyanide, Total	0.34u	0.20u	NC	1.0
		Phosphate by IC	1.3 u	1.3 u	NC	1.0
		Chromium VI	0.41u	0.41u	NC	1.0
		Sulfate by IC	6.8	7.2	5.2	1.0
		Nitrate Nitrite	15.4	15.5	0.87	5.0
		Ammonia, as N	4.8 u	5.0 u	NC	1.0
		Oil & Grease Gravimetri	681 u	681 u	NC	1.0
		pH	8.7	8.7	0.0	1.0

Lionville Laboratory, Inc.

INORGANICS LABORATORY CONTROL STANDARDS REPORT 07/03/03

CLIENT: TNUHANFORD F03-006 H2264 LVL LOT #: 0306L625

WORK ORDER: 11343-606-001-9999-00

SAMPLE	SITE ID	ANALYTE	SPIKED SAMPLE	SPIKED AMOUNT	UNITS	%RECOV
LCSS1	03LC058-LCS1	Cyanide, Total LCS	1.91	2.0	MG/KG	95.4
LCSS2	03LC058-LCS2	Cyanide, Total LCS	9.92	10.0	MG/KG	99.2

Lionville Laboratory Use Only
0306L625

Custody Transfer Record/Lab Work Request

Page 1 of 1

LVLI LIONVILLE LABORATORY INC.

12

FIELD PERSONNEL: COMPLETE ONLY SHADED AREAS

Client: TNU-HANFORD F03-006
Est. Final Proj. Sampling Date:
Project #: 11343-606-001-9999-00
Project Contact/Phone #:
Lionville Laboratory Project Manager: OJ
QC: SPEC Del: STD TAT: 30 days
Date Rec'd: 6-13-03 Date Due: 7-17-03

			A		B		C		D	E
Refrigerator #			2	1					1	2
#/Type Container	Liquid									
	Solid		1AG		1AG		1AG		1AG	1AG
Volume	Liquid									
	Solid		125		60		60		125	60
Preservatives										
ANALYSES REQUESTED →	ORGANIC: VOA	BNA	Pest/PCB	Herb	Alcohols 2 Glycols Ketones		INORG: ICP Metal	CN	I.C. Anions	NO2 NO3 Org Etc
Lionville Laboratory Use Only		0625X 0DRO 0GRO			0GCSC		MET0		INORG0	ININ2 IOGTK ICR6

MATRIX CODES:
S - Soil
SE - Sediment
SO - Solid
SL - Sludge
W - Water
O - Oil
A - Air
DS - Drum Solids
DL - Drum Liquids
L - EP/TCLP Leachate
WI - Wipe
X - Other
F - Fish

Lab ID	Client ID/Description	MS	MSD	Matrix	Date Collected	Time Collected	VOA	BNA	Pest/PCB	Herb	Alcohols/Glycols		ICP Metal	CN	I.C. Anions	NO2/NO3
001	B161C2	✓	✓	S	6-11-03	0925		1			1		1		1	1

Special Instructions: SAF # F03-006

MET0: RCRA + Sb. Be. Bi. B. Cu. Ni

INORG0: IC: Cl, F, NO3, NO2, PO4, SO4
INH3N, IPH, ICNTO

DATE/REVISIONS:
1.
2.
3.
4.
5.
6.

Lionville Laboratory Use Only

Samples were:
1) Shipped ✓ or Hand Delivered
Airbill # SEE BELOW
2) Ambient or (Chilled)
3) Received in Good Condition (Y) or N
4) Samples Properly Preserved (Y) or N
5) Received Within Holding Times (Y) or N

Tamper Resistant Seal was:
1) Present on Outer Package (Y) or N
2) Unbroken on Outer Package (Y) or N
3) Present on Sample (Y) or N
4) Unbroken on Sample (Y) or N
COC Record Present Upon Sample Rec't (Y) or N
Cooler Temp. 1.5 °C

Relinquished by	Received by	Date	Time
FEDEX	[signature]	6-13-03	0910

Relinquished by	Received by	Date	Time
COMPOSITE WASTE		ORIGINAL REWRITTEN	

Discrepancies Between Samples Labels and COC Record? Y or (N)
NOTES: 7929 0769 7042

FH-Central Plateau Project	CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST	F03-006-189	Page 1 of 1

Collector KP 6-11-3 Johansen/Pope/Pfister/Hughes	**Company Contact** LC Hulstrom	**Telephone No.** 373-3928	**Project Coordinator** TRENT, SJ	**Price Code** 8N	**Data Turnaround** 45 Days
Project Designation 200-PW-2/200-PW-4 OU - Borehole Soil Sampling	**Sampling Location** 216-B-12 (C3246); 197.5-200		**SAF No.** F03-006	**Air Quality** ☐	
Ice Chest No. ERC 01-037	**Field Logbook No.** HNF-N-3361	**COA** 117504ES10	**Method of Shipment** Federal Express		
Shipped To 6-9-03 ~~EBERLINE SERVICES (Formerly TMA)~~ Rezra	**Offsite Property No.** A030286		**Bill of Lading/Air Bill No.** SEE 05PC		

POSSIBLE SAMPLE HAZARDS/REMARKS

RADIOACTIVE TIE TO: B171P5

Special Handling and/or Storage

Cool 4C

Preservation	Cool 4C	Cool 4C	None	Cool 4C	Cool 4C	None	None	None		
Type of Container	aG	aG	aG	aG	aG	aG	aG	aG		
No. of Container(s)	1	1	1	1	1	1	1	1		
Volume	60mL	125mL	60mL	125mL	60mL	60mL	60mL	60mL		
SAMPLE ANALYSIS	See item (1) in Special Instructions.	See item (2) in Special Instructions.	See item (3) in Special Instructions.	See item (4) in Special Instructions.	NO2/NO3 - 353.2; Oil & Grease - 413.1; Chromium Hex - 7196	See item (5) in Special Instructions.	See item (6) in Special Instructions.	Tritium - H3		
Sample No.	Matrix *	Sample Date	Sample Time							
B161C2	SOIL	6-11-3	0925	X	X	X	X	X		

CHAIN OF POSSESSION

Relinquished By/Removed From	Date/Time	Received By/Stored In	Date/Time
R. Pfister/[illegible]	6/11/3 1417	[illegible]	6/11/03 1417
[illegible]	6/11/03 1417	R. Fellers/R. Fahlbusch	6.11.03 1417
R. Fellers/R. Fahlbusch	6.11.03 1417	1B 3228	6.11.03 1200
1B 3228	6.12.03 1200	R. Fellers/R. Fahlbusch	6.12.03
R. Fellers/R. Fahlbusch	6.12.03	FedEx	
FedEx	6-13-03 0910	[illegible]	6-13-03 0910

SPECIAL INSTRUCTIONS KP 6-11-3

~~The lab is to achieve a detection limit of 50.0 pCi/g for C-14.~~ Report kerosene and diesel range compounds from WTPH-D analysis. FH acknowledges that holding times (less than 14 days) may not be met by the lab due to the radl characteristics.

(1) Alcohols, Glycols, & Ketones - 8015 {1-Butanol, Diethyl ether, Ethylene glycol, Methanol}
(2) Semi-VOA - 8270A (TCL); Semi-VOA -- 8270A (Add-On) {2-Butoxyethanol, Tributyl phosphate}; TPH-Diesel Range - WTPH-D; TPH-Gasoline Range - WTPH-G
(3) ICP Metals - 6010A (Supertrace) {Arsenic, Barium, Cadmium, Chromium, Lead, Selenium, Silver}; ICP Metals - 6010A (Supertrace Add-On) {Antimony, Beryllium, Bismuth, Boron, Copper, Nickel}; Mercury - 7471 - (CV)
(4) IC Anions - 300.0 {Chloride, Fluoride, Nitrate, Nitrite, Phosphate, Sulfate}; Ammonia - 350.3; pH (Soil) - 9045; Total Cyanide - 9010
~~(5) Gamma Spectroscopy {Cesium-137, Cobalt-60, Europium-152, Europium-154, Europium-155}; Gamma Spec - Add-on {Cesium-134, Radium-226, Radium-228, Th-126}; Total Uranium; Americium-241, Isotopic Plutonium, Isotopic Uranium; Gamma - Iodine-129, Nickel-63, Neptunium-237~~
~~(6) Tech-99, Strontium-89,90, Total Sr, Isotopic Thorium, Thorium-232~~

KP 6-11-3

Matrix *
S=Soil
SE=Sediment
SO=Solid
SI=Sludge
W = Water
O=Oil
A=Air
DS=Drum Solids
DL=Drum Liquids
T=Tissue
WI=Wipe
L=Liquid
V=Vegetation
X=Other

LABORATORY SECTION	Received By	Title	Date/Time
FINAL SAMPLE DISPOSITION	Disposal Method	Disposed By	Date/Time

BHI-EE-011 (03/01/2002)

LIONVILLE LABORATORY INCORPORATED
SAMPLE RECEIPT CHECKLIST

JENT: TNU-HANFORD

rchase Order/Project:

DATE: 6-13-03

F# / SOW# / Release #: F03-006

boratory SDG #: 0306L625

OTE: ALL ENTRIES MARKED "NO" MUST BE EXPLAINED IN THE COMMENT SECTION

1.	Custody seals on coolers or shipping container intact, signed and dated?	☑ Yes	☐ No	☐ N/A	☐ see Comment #
2.	Outside of coolers or shipping containers are free from damage?	☑ Yes	☐ No	☐ N/A	☐ see Comment #
3.	Airbill # recorded?	☑ Yes	☐ No	☐ N/A	☐ see Comment #
4.	All expected paperwork received (coc and other client specific: historical data, alpha/beta or other screening data as applicable)? (paperwork sealed in plastic bag and taped to inside lid)	☑ Yes	☐ No	☐ N/A	☐ see Comment #
5.	Sample containers are intact?	☑ Yes	☐ No	☐ N/A	☐ see Comment #
6.	Custody seals on sample containers intact, signed and dated?	☑ Yes	☐ No	☐ N/A	☐ see Comment #
7.	All samples on coc received?	☑ Yes	☐ No	☐ N/A	☐ see Comment #
8.	All sample label information matches coc?	☑ Yes	☐ No	☐ N/A	☐ see Comment #
9.	Laboratory QC samples designated on coc? (QC stickers placed on bottles?)	☑ Yes	☐ No	☐ N/A	☐ see Comment #
10.	Shipment meets LvLI Sample Acceptance Policy? (identify all bottles not within policy. See reverse side for policy)	☑ Yes	☐ No	☐ N/A	☐ see Comment #
11.	Where applicable, bar code labels are affixed to coc?	☐ Yes	☐ No	☑ N/A	☐ see Comment #
12.	coc signed and dated?	☑ Yes	☐ No	☐ N/A	☐ see Comment #
13.	coc will be faxed or emailed to client?	☑ Yes	☐ No	☐ N/A	☐ see Comment #
14.	Project Manager/Client contacted concerning discrepancies? (name/date)	☐ Yes	☐ No	☑ N/A	☐ see Comment #

Cooler # / temp (°C) and Comments:

ERC 01-037 1.5

Laboratory Sample Custodian: Carl Hung

Laboratory Project Manager: